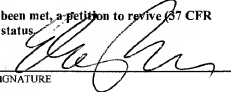


FORM PTO-1190 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 2001-7032	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	
				09/856566	
INTERNATIONAL APPLICATION NO. PCT/CA00/01159		INTERNATIONAL FILING DATE 05 October 2000 (05/10/00)		PRIORITY DATE CLAIMED 07 October 1999 (07/10/99)	
TITLE OF INVENTION METHOD OF CALCULATING A CONSUMER PRICE INDEX					
APPLICANT(S) FOR DO/EO/US TWARDOWSKI, PETER					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>					
Items 11 to 20 below concern document(s) or information included:					
<p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p> <p>18. <input checked="" type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> <p>20. <input type="checkbox"/> Other items or information:</p>					

U.S. PATENT APPLICATION NO. (if known) 097/856566	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER																					
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =		CALCULATIONS PTO USE ONLY																					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		\$																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> <th style="width: 20%;">\$</th> </tr> <tr> <td>Total claims</td> <td>1 - 20 =</td> <td></td> <td>x \$18.00</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>- 3 =</td> <td></td> <td>x \$80.00</td> <td>\$</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$270.00</td> <td>\$</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	Total claims	1 - 20 =		x \$18.00	\$	Independent claims	- 3 =		x \$80.00	\$	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$	TOTAL OF ABOVE CALCULATIONS = \$		
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MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$																			
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.		\$																					
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +		\$																					
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a. <input checked="" type="checkbox"/> A check in the amount of \$ 500.00 to cover the above fees is enclosed.																							
b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.																							
c. <input type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. _____. A duplicate copy of this sheet is enclosed.																							
d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.																							
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive 37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.																							
SEND ALL CORRESPONDENCE TO:																							
ELIAS C. BORGES KOZLOWSKI & COMPANY 5468 Dundas Street West, Suite 401 Toronto, Ontario, M9B 6E3																							
		SIGNATURE 																					
		ELIAS C. BORGES NAME																					
		46,424																					
		REGISTRATION NUMBER																					

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

 Docket No.
2001-7032

Serial No.

Filing Date

Patent No.

Issue Date

 Applicant/ **PETER TWARDOWSKI**
 Patentee:
Invention: **METHOD FOR CALCULATING A CONSUMER PRICE INDEX**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled above and described in:

- ☒ the specification to be filed herewith.
☐ the application identified above.
☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern or organization exists.
☐ Each such person, concern or organization is listed below.

***NOTE:** Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR 1.27)

 FULL NAME
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☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

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I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR PETER TWARDOWSKI

SIGNATURE OF INVENTOR Peter Twardowski

DATE: May 16-2001

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

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TITLE: METHOD OF CALCULATING A CONSUMER PRICE INDEX**Field of the Invention:**

This invention relates to economic indicies and in particular to a modified Consumer Price Index (CPI).

BACKGROUND**DEMAND THEORY**

In most cases of economic analyses, demand is described as a relation of price and quantity holding all other variables constant. Is it correct to hold everything constant just to explore in so many details all characteristics of only two variables and at the same not to see the entire picture? The following analysis of consumer preferences takes a different approach. A new variable is included but prices and a consumer's budget are being kept as constant.

DETAILED DESCRIPTION

Price ratios, budget line and the third variable

According to the marginal rate of substitution, at certain price ratios (point of tangency of an indifference curve to the budget line), a consumer is willing to substitute some quantity of one good for a one unit of another. However, such substitution captures consumers' preferences only at a particular point in time. As a matter of fact, **time is moving continuously. It is the third variable** and should never be ignored.¹ How well then this theory holds with respect to time when prices and a budget are constant? For example, as time goes by a consumer might remain indifferent between purchasing rugs and purchasing paintings because time is not a factor. It is not the same when comes to bundles of goods called meals and bundles of compact discs. Assuming no other consumption, time changes discs for inferior goods. More precisely, as time goes by, the consumer is willing to give up discs at an accelerated rate not only to obtain additional meal (assuming that additional meals can be stored in the fridge) but to begin consumption of the original one. What happens here (on the graph), does the consumer move along the indifference curves or go on higher or lower ones? Movement along any particular curve implies indifference, higher or lower curves are results of changes in prices or income. The only explanation lies in the shape of these curves. The beginning of consumer's awareness about the importance of meals causes the indifference curves to move. Assuming meals on a vertical axis, the curves sooner or later must touch this axis. As time goes by, the curves become flatter and flatter. At a certain point, the consumer wants to give up the entire remaining quantity of discs since they no longer represent any utility. At that point the indifference curves are flat lines. Once the consumer begins to consume the meal, the indifference curves start to go back to their original shapes. The same process could be repeated over and over if the time gaps between each meal are that great. In reality, the consumer does not allow these gaps to happen.

If the indifference curves are moving, do they intersect? By just looking at a graph, a two-dimensional picture and adding more and more indifference curves as time goes by, a human eye detects intersection of these curves. In reality or virtual reality the points of

¹In geometry time is referred to as a fourth dimension after height, length and depth. Because only three variables are analysed here, time is placed on a depth axis.

intersections are actually **the points of overlaps**. There are time gaps between these curves.²

NOTE:

Technically speaking, the above example is not fully explanatory.

First, an assumption of non satiation (more of anything is always better) which only refers to the stock of goods, does not imply a full consumption at once. At certain frequencies in time, only specific quantities of goods are consumed (used up). Therefore, not all indifference curves change their shapes but only those which are close to the origin, those attributable to a single meal. With respect to time, an upper bound (called consumption) exists for them and that bound is a utility maximization point.

Second, "lexicographic preferences" could be a better explanatory method in this particular case. These preferences violate the assumption of continuity by imposing restrictions to three meals a day. Regardless of the number of discs, three meals a day are strictly better than one meal or five meals. However, time is continuous by itself. At the greater or smaller fraction than three, the consumer could still place the same value for the discs.

Finally, this example shows the significance of time in a consumer's demand. It does not focus on indifference curves. Further and detailed analysis is beyond the scope of this project.

This "time" example has two very rigid assumptions of prices and the consumer's budget as constants. However, the consumer's income as well as the budget might change in time and so the expenditures for meals. The budget constraint assumption therefore does not apply well when time becomes a part of analysis. It might not seem so in the case of constant prices since they are set by producers. But even this assumption is not fully accurate. At no shortages in supply the consumer would still be willing to pay higher prices for meals just to consume them on time. A typical example is a situation where the consumer forgets to buy groceries in a supermarket during the day and pays higher prices at a 24-hour convenient store.

Overall it should be remembered that it is rather easy but incomplete to capture consumers' preferences at a particular point in time, but it could become difficult however

²This particular example could look very well in motion pictures but not so good on a paper and therefore graphics are excluded here.

quite realistic to measure such preferences with respect to time. Time is an absolute variable just because nobody can stop it.

To better understand demand with respect to time, the following three sections deal with different types of goods. First section deals with those goods where demand for them have **specific time constraints**. Necessities, it is the right word for these goods. They are simply physiological needs of humans.³ In the second section, the demand for goods does not have time constraints at all. These goods are non necessities and are psychological wants of humans.⁴ The final section is about semi necessities which are goods that belong somewhere in the middle.

Demand for necessities - needs

When discussing necessities, a reference to food or meals is the best one since food is a number one necessity and there isn't a slightest doubt that it is not. Since food is a necessity then beef, pork or chicken must be as well? The answer is no. Why? Demand for necessities has specific time constraints however demand for beef, pork or chicken alone has a budget constraint. What it means is that a consumer may never eat beef because of taste, income or a price of chicken and therefore only eat a chicken. The exact opposite may apply to other consumer. However, both consumers eat three meals a day. All consumers eat three meals a day. That's why food is a necessity but any individual food items alone are not. How then the demand for food can be expressed in a mathematical way (demand function)? It is not a function of price and quantity but **time and quantity** (three meals a day, every day).

Why then the price is missing? The answer to it lies in understanding what demand is. The problem why demand is understood as a function of price and quantity has roots in fundamental economic principals (the law of demand). Generally speaking the law says that at lower prices, greater quantities of particular goods are purchased and vice versa. But **this basic law does not apply to food**. Demand for three meals a day exists even at higher food prices. Why then the price and budget constraint had always been such a crucial component of demand? The answer is very simple - the economic concept of scarcity. Budgets keep

³Humans, it is the right word when physiological needs of people are discussed.

⁴There must be a better term for non necessities. For the purpose of this project however, the term non necessities will not be substituted by any other term.

consumers' demands reasonable otherwise consumers would demand (without a cost) as much as economy produces. This has definitely some merits as far as the upper bounds of demands but what about the lower bounds? The lower bounds had never been drawn in economics. The reason for it can be found in one of the greatest error in economics and that is an error in assumption, the assumption that people must have money. As a matter of fact, people need money to pay the bills and broadly speaking can't live well without money. Fact however is not an assumption. Fact is only a reality. What if some people don't have money? That is a reasonable assumption.⁵ Certain goods or quantities will not be produced. But is that automatically means no money, no demands? For example, if a consumer can only afford a single meal in a given day why there is an absolute certainty that the demand for three meals exists? Because if the money is granted to pay for additional two meals, the consumer will not save such money but will buy and consume the meals like everyone else. Even millionaires consume three meals a day. Therefore when comes to necessities, people or humans have the same or identical demands and money is not an issue. What are these necessities? They are food, shelter, clothing and footwear, transportation and hygiene products. There are other necessities such as water and electricity. Water had always been a necessity but electricity became one.⁶

Are time and quantity the only variables in demand functions for necessities? The answer is no. The demand for clothes depends on an outside's temperature and temperature therefore is a variable. To write down specific demand functions for necessities could be tricky. For example transportation, at a very specific time during the day people need transportation to get to work. How then transportation should be expressed in terms of quantity as far as interrelations of a vehicle and distance? The greater the distance, the greater the needs for a reliable, punctual and fast means of transportation. But these reliable, punctual and fast means belong to psychological not physiological needs and are beyond definition of necessities. It could be hard to express them mathematically. In this project it will not be

⁵That is also a fact but even this important fact was never analysed in economics. Also, the fact that the demand for three meals a day, every day exists, is really based on assumption, an assumption that the time will never stop since the demand for meals depends on time. Once the time stops, the demand for food disappears. The assumption that the time might stop is unrealistic and there is no need to justify any further an original assumption.

⁶Why certain goods become necessities is explained in the semi necessities section. Also, electricity as a necessity means that people need lights in order to see when staying up late.

important to know the demand functions but to understand what demand for necessities is all about. Demand for necessities is about time.

Mathematically speaking, time is the independent variable (input numbers for a function) and quantity a dependent variable (output numbers for a function) in a demand function for food. Price is missing because quantity demanded depends only on time. As time goes by, the quantity demanded is not affected. This can be easily verified from food consumption. At higher food prices, consumers would not wait for them to come down but buy whatever quantities are required and that's simply true. On the other hand, all those consumers without money would still demand food at zero prices (free). But the overall result cannot be zero since time and quantity are never zero. That's precisely why, time and quantity are the only variables in a demand function for food. The exact opposite occurs for beef, chicken or pork (non necessities) as mentioned earlier. These demand functions have two variables: price and quantity. Time is not a variable even though everything happens at some point in time.⁷ At the elastic portion of the demand curve, price is an independent variable. When "taste" takes priority over price changes (an inelastic portion), quantity becomes the independent variable.⁸

Demand for necessities is constant and continuous. As time goes by, the physiological needs of humans don't change and demand doesn't go up or down, it is the same. Such constant and continuous demand will be a key factor in the Consumer Price Index analysis. But for now two crucial things about necessities must be remembered. First, the demand for necessities has specific time constraints and the demand for non necessities budget constraints. Second, people don't need to have money to have demands for necessities and that's economics.

Demand for non necessities - wants

This section is about consumers. Who should be classified as consumers? For sure people who have money but from non necessities point as well, all those who can afford necessities and much more.

⁷Technically speaking that's not correct because for non necessities, the occurrence and duration of demand depend on the recognition of price, duration of that price plus other psychological factors of consumers. For the sake of simplicity it is OK to say that price and quantity are the only variables here.

⁸This will be explained in the semi necessities section.

The most characteristic feature about non necessities is an ambiguous process of consumers' decisions which results from abundance of available choices and alternatives. There should be no doubt that unlike food, compact discs are non necessities. They simply fall into a category of psychological wants and pleasures.

The following non necessities' example is a long one but it shows quite well what demand for non necessities is all about.

If there is a consumer who has a CD player and one thousand discs and thinks of buying additional nine discs what factors she or he considers? It should be mentioned first that the ratio of one thousand to nine, existing to new discs had been carefully chosen. Such a ratio is simply at the edge of a propensity to consume, not a sharp edge one thousand to one but still the edge. So, if the consumer would like to add nine more discs to already such large collection, it is simply a matter of quantity, but to be more specific, what if the consumer wants to buy all nine symphonies of Beethoven (one symphony on a disc) performed for example by the Toronto Symphony even though the consumer has these symphonies however performed by the Montreal Symphony? Will there be a difference in interpretation, how much difference? What does the consumer like more, Beethoven or the Toronto Symphony? If the answer is Toronto Symphony then the consumer should perhaps look among one thousand discs to find symphonies by other composers played by the Toronto Symphony and enjoy the music without additional expenditure. If the answer is Beethoven then the consumer should be satisfied with the Montreal Symphony. But if the consumer appreciates the music of Beethoven as equally as performances of the Toronto Symphony (even if for some unknown reasons there aren't in the entire collection many compact discs combining these two), then the consumer still has a great dilemma of demanding only the difference but facing to pay a full price for the discs. This type of demand could be called a **marginal demand**. In this particular case of marginal demand, the consumer doesn't know the utility maximization point and hesitates to buy the discs.⁹ There is some good news to it. From time to time compact discs are offered at discounts. The consumer doesn't know when nor how much however **can wait** for prices to come down and then decide again. In the meantime, a

⁹Marginal demand can be defined as positive expectations in the rate of change in marginal utility resulting from demanding additional, not identical but a similar product (or the difference in that product), after the difference in prices of both products is calculated and the original product can still be consumed. In the case of discs, even a small increase in marginal utility can be offset by frequent listening to symphonies.

salesperson approaches the consumer trying to sell a cellular phone just by saying that it's time to diversify the taste and enjoy the full value of the product (the consumer never had a cellular phone before). The salesperson understands that the consumer's demand for discs is marginal and is quite optimistic about the "shift" from the marginal demand of one product to a full demand for another product.¹⁰ That's not everything. Another salesperson sells stocks and bonds and thinks that it isn't a bad idea to wait for discounts on discs. This salesperson tells the consumer how great returns on investments are and advises to invest now and when discs are on sale, withdraw only a required amount from the original investment, retain the rest and still earn an interest. The consumer hesitates because in a long run the price of discs goes up however, likes the idea of investing.

In this particular case the consumer can only make a single choice. Buying discs, a cellular phone and investing the money all together means, consuming only a single meal a day for an entire week and that is not a rational decision.

The classical music lover can take time and carefully choose the best deal because time in this case is not a factor. It might not be so if a consumer is a pop music listener and also has one thousand discs and plans to buy few more. Such a consumer could place the highest value for the latest hits and waiting for discounts means compromising and buying classics. This consumer also thinks of buying a cellular phone and investing money but all together faces a different dilemma. Among one thousand discs there are many oldies which no longer bring satisfaction as do the latest hits. But even the latest hits will soon become classics. The decision therefore must be made quickly because time is a factor here. Someone could be inclined to say that the demand for these discs has specific time constraints, the same as necessities. That is true with one major exception, the consumer does not have to buy them. Therefore, **specific time characteristics** not constraints, is the appropriate term for non necessities.

Unlike necessities where demand is continuous and solid, the demand for non necessities is not. It can appear and disappear as in the case of the pop music listener and if marginal (the classical music listener), is subject to captivity by salespeople. What hasn't been mentioned yet is that changing demands which are so characteristic to non

¹⁰The term shift in demand is going to be used differently here than it is used in economics. Shift in demand will refer to the shift in a focus of attention.

necessities contribute to complexity and quality of life. If necessities can be described from the point of cost of living, non necessities make up the standard of living. Understanding demand for non necessities could be difficult and only advanced topics may cover the material thoroughly.

Demand for semi necessities

There should be some system classifying necessities and non necessities because certain goods create problems. For example appliances such as refrigerator or stove, if it is necessary to store the food and cook the meals, are appliances necessities? What about a haircut, is it a matter of fashion or hygiene? Umbrella, if it protects the body from getting wet, does it serve physiological needs? People can't live without money so must have wallets to carry them? At the end comes bread, eggs and milk. Why most people buy them regardless of price?

It is impossible to classify all goods into two categories without a doubt. There are thousands of goods which belong somewhere in the middle. A reference to them as semi necessities is the best solution. It takes critical thinking to find out what these goods are. However, it can also be done in a real life experiment. Such experiment could be difficult but achievable. Several consumers would be given lots of money but asked to spend only a bare minimum on necessities and not to spend on anything else if possible. As time would have gone by, some consumers could not resist and start spending on other goods. The important part of it is to know the chronological order of expenditures with respect to time because further and further they can be postponed, less and less of necessities the goods are. The point of it is to prove that semi necessities are not equal because they are not bought at the same time. They are simply a creation of a growing standard of living. With comfortable and growing budgets people repeatedly buy them, later depend on them and can't live without them. The dependency on semi necessities for a long period of time is therefore a creation of necessities. How much is needed to live, is really a question where do people live. In a civilized world a phone or a watch can "practically" be called necessities because 95% population or even more have them. The best example however is electricity. Now electricity is not only a necessity alone but also a commodity which cannot be excluded from the use of appliances. But even in a civilized world there is poverty and people have to live on tied budgets. Such people could be a good indication how to draw the line between necessities and

semi necessities however, their budgets are not the same and in many cases, demands could exceed budget constraints. Good intuition and abstract thinking is perhaps the best guidance to understand the difference.

Another category of semi necessities goods are those which will never become necessities. Food items such as bread, eggs and milk belong to an important group of this category. It is crucial to notice here that there are no substitutes for water and electricity, that's why they are necessities. Also there are no substitutes for food but unlike water or electricity, food is an aggregation of items which to the certain extend, substitute and complement each other. If for example the price of bread goes up, a consumer might substitute bread for rice or potatoes, but how convenient these substitutes are? If the consumer is only able to maximize utilities in terms of meals (necessity) but unable to maximize utilities in terms of taste (non necessity), are such substitutes satisfactory? Definitely not because most consumers pay higher prices for bread because are not willing to forego consumption of bread. One major reason for it is the growing standard of living where bread becomes more and more affordable and therefore, the demand for bread does not disappear in time. That's why bread should be considered as a semi necessity. Only very high prices can cause a shift in demand from bread to other goods. Someone can still ask why beef, pork or chicken are non necessities if consumers are unwilling to forego them since standard of living goes up? It is a very good question and it's hard to give a straight answer. Beef, pork and chicken can be all considered semi necessities because consumers never eat bread only, but meat as well. However, the price of bread is much lower than the prices of meat. Higher bread prices may not affect quantity consumed but higher meat prices may encourage consumers to look for other solutions to a good, affordable meal. Why lobsters, oysters and caviar are not necessities?

The most characteristic feature of semi necessities is **time and quantity as independent variables** and price as a dependent variable in a demand function.¹¹ To explain this differently, there are two ways to do shopping. First is to take for example \$100 and shop around for deals and discounts. Second is to list all goods needed to be bought, take the money, go out and buy them. In a first case price is the independent variable because quantity

¹¹Unlike necessities, the demand for semi necessities has a price and that is a sharp line of distinction. Also, the demand function for semi necessities is a consumption function for necessities. Consumption of necessities occurs at cost.

demanded depends on price or, the demand is for the right price. Time is not significant and at high prices, nothing might be purchased. This is very true with non necessities. In a second case the demand for bread, eggs and milk for example is actually a demand for specific quantities of specific goods at specific time. The demand curve for semi necessities is therefore inelastic. More inelastic the curve is, more of necessities the goods are. The exact opposite occurs for non necessities. More elastic the curve is, more of non necessities the goods are. However, the demand for non necessities can be inelastic as well. That's true but why? It only depends on consumers' budgets. Time constraints can play a key role in identifying non and semi necessities.

CONCLUSIONS

If price can be excluded from the concept of demand then what really is demand? Is it anything more than a recognition of needs and wants and the desire to consume and enjoy goods which satisfy these needs and wants? The acceptance of such definition creates implications. The basic economic principle of supply and demand express the interests of consumers and producers in one very universal way and that is the language of money. The concept of demand however becomes more complex when time replaces price in necessities and could become even ambiguous by adding more non monetary factors to it. If demand is indeed a recognition of needs and wants then is it correct to call demand what is known as the demand curve?¹² It's easier to answer this question by explaining why the word demand should not be used for this curve. For example, if there exists an economic entity with high poverty and some people can only afford a single meal a day, is such economy in equilibrium? Definitely not because supply of single meals does not intersect demands for three where in fact the equilibrium is.¹³ If people consume only what they can afford and suppliers take into account such afford ability, is **consumption** the better or the right word for what is known as the demand curve? There is a very strong assumption in favour of consumption. People don't buy goods and not consume them because otherwise it would

¹²Non monetary factors are also present in supply but all goods are supplied only and only at cost and to simplify this argument, supply is assumed to be the right word for the supply curve.

¹³This work does not lead to analysis of conditions for equilibrium. It is now obvious that demand, supply and consumption of necessities must be in harmony in order for an equilibrium to exist.

simply be uneconomical.¹⁴ To say that in a simpler manner, goods are supplied for consumption. Also in a general and aggregate sense, at higher prices less will be consumed and vice versa. This very much resembles the fundamental law of demand.

The remaining question is how demand fits in the entire picture if there are only two curves: supply and consumption?¹⁵ The complexity of demand can make it hard to graphically explain it but it's there and will be there. It is a set of different signals which may or may not trigger an interest and response of suppliers and producers. An understanding of demand means an understanding of economic foundations.

This section closes with a new economic joke just to justify one more time why consumption is the right word for what's known as the demand curve and demand being a wrong word. Question: What is the difference between consumers and humans? Answer: Consumers are all those who have money, humans are all those who have demands.

¹⁴Is acquisition of goods a process of demand or is it a beginning of consumption? It is not physical consumption but once consumers incur the cost, the consumption is assumed to happen.

¹⁵The consumption curve overlaps the supply curve because of the time gaps. first goods are produced then consumed.

CONSUMER PRICE INDEX

In this part, the demand theory with respect to time will be used to question the existing methodology of the Consumer Price Index. Before getting into the index, a new look at definitions and concepts first, is imperative to understand the full idea of price movements and how all of it fits into the CPI. The analysis of the index provides recommendations for a change and should be looked at with an objective criticism just because there are real issues there and the stakes are high.

What is a pure price movement?

Statisticians measure pure price movements by taking into account all improvements made to the products which are being measured. Pure price movement is therefore a price movement of the same product from one period to another. This concept however is only a tangible one. There are many intangible features causing prices to move. These features significantly overwhelm the tangibility concept because they are the real sources of price movements. In this section (because it is about the CPI), only those features applicable to consumers are going to be examined. Supply of goods and monetary policy are assumed to be all right.

Demand

As mentioned in a non necessity section, consumers' demands are changing and appear and disappear in time. It all results from a volume and variety of choices available to consumers in the market. The velocity of shifts in demand and the duration of demands will never be known since they happen in consumers' minds. In many cases it is incorrect to say that at very low prices demands still exist. The pop music listener had technically speaking free discs to satisfy musical pleasures but still considering to buy the brand-new stuff. On the other hand, higher prices may not affect quantity demanded because if the classical music listener buys a cellular phone, such a consumer can only identify a level of personal desire and match that with the asking price. If this is a first cellular phone, the level of such desire is high and the consumer probably doesn't know historical prices of the phones which could be lower. In general terms, retailers don't know what's happening to consumers' demands but a lack of response from consumers causes prices to be adjusted accordingly, prices therefore go down.

Prices can also go up if consumers too often make impulsive expenditures due to sudden fascinations. Demand is perhaps the most important intangible feature which explains price movements.

5 Timing

A silence from consumers is not necessarily a signal to retailers that the demand for a product no longer exists. The consumers' comfort of postponing expenditures has an effect on price movements. Consumers simply wait for prices to come down and buy when the time is right. But waiting can also backfire. If too many consumers enter the market for a product at the same time, the prices can rise because there will be shortages in supply. The real source of the reason in this case is not shortages but bad timing and timing, is an intangible one.

Savings

Changing propensities to save has the same effect on prices as timing. Saving is a future's consumption. The so-called lack of consumers' confidence sometimes is nothing more than a growth in savings even when there are no layoffs and the incomes don't change.

Why necessities?

It is very obvious that all intangible features of price movements apply only to non necessities. No human saves money by cutting on meals, no human waits for the right time to buy them because, the demand for three meals a day exists and will exist. Necessities therefore should become a focus in measuring inflation because the concept of pure price movements applies to them. With necessities many technical problems can be eliminated right from the beginning.¹ It is practically impossible to do that with non necessities. There are always going to be intangible movements. What about semi necessities, do they create problems? The answer is yes and no but the food section in major components will explain the phenomena about semi necessities.

¹This is only a general idea because to measure price movements for meals, one must measure prices of food items which are semi and non necessities. It will be explained later.

Inflation, deflation, a problem of inflation and a problem of deflation

Traditionally speaking, inflation and deflation are the end results of reasons causing price changes even if all the reasons are not necessarily known. This general concept includes all the goods and services produced in the economy. But more specific terms could be used to address price movements for necessities and non necessities. These new terms will not be brought here. Instead, the notion of “a problem of inflation and a problem of deflation” will be evaluated. For example, if the price of compact discs and the food prices go up, the word inflation comes in as an explanation for both. If consumers pay those prices, is there a problem of inflation in both cases? Consumers don’t have to pay higher prices for discs but they want and they do. On the other hand, consumers may not want to pay higher prices for food, but they must. These two are not the same inflations because there isn’t a problem of inflation when comes to discs since consumers voluntarily pay higher prices for them (assuming that they know about it), but there is a problem of inflation when comes to food prices since consumers can do nothing about it. So, the problem of inflation applies only to necessities because of time constraints. What about a problem of deflation, is it simply an opposite to inflation? The problem of deflation occurs because there are no time indicators when non necessities have to be purchased when their prices keep going down. Technically speaking however, it shouldn’t be a problem since consumers are simply taking advantage of lower prices in the future.² The only real problem of deflation is a scenario when consumers trade necessity goods between themselves knowing that prices of these goods will be significantly lower in the future and therefore keeping money in saving accounts. However, this situation is highly unlikely to occur in today’s world.

²Unfortunately, it is a problem in macroeconomics.

CPI analysis

WEIGHTS

Weights are the reason why CPI requires changes.

This part focuses on weights.

Why?

What if all goods in the Consumer Price Index can be classified as necessities, semi necessities and non necessities or to make it simpler, necessities and non necessities? What if consumers spend 50% on necessities and 50% on non necessities? What if there is an inflation of 5% for necessities and -5% for non necessities (deflation of 5%) or vice versa?

The Consumer Price Index will read this as 0% inflation (no inflation). Is that correct?

In a big picture it might seem correct because the existing methodology applies weights which come from surveys of family expenditures. It is not correct since measuring non necessities' prices means not measuring pure price movements. But that's not all, there is something more important which makes the entire system very vulnerable. If for example individuals save or invest money for future's consumption (long term investments), do they know what exactly will they spend on? Not exactly but for sure on necessities since the demand for necessities depends on time and does not disappear. More, most individuals save much less than they earn and according to a forward-looking theory of consumption, when these individuals become seniors, they might not be able to maintain the same standard of living as they did in the past when being employed because of a dependency on fixed incomes. The type of standard of living fixed income people face can be hard to estimate. The only way to do it is to measure existing expenditures of seniors and then apply weights accordingly. However, this excludes all those who are saving for their retirement now while being in a labour force and have many years ahead before becoming seniors. Therefore, it is impossible to know the future's weights. That's perhaps why the present methodology does not address the future at all. It cannot really do that because the weights are unknown or they have to come from somewhere. The only thing which remains certain is a demand for or a consumption of necessities. So, if necessities have 5% inflation or 5% deflation, is it correct

to say that the inflation rate is 0% since non necessities make up the other 5%? The answer is no because such an inflation rate does not apply to savings or investments. At continuing 5% deflation for necessities, seniors in particular will benefit from lower prices in the future but keep losing at 5% inflation. To leave the existing methodology without a change is just risky.

5 It is better to make changes now, because there are only modest price movements in the Canadian CPI. Not doing anything now could mean dealing with unknown in the future if the price movements become uncommon.

But how to make any changes if the future's weights are unknown? The remaining of this project is about solutions to a "rate" problem for savings and investments. A core solution to it is a Consumer Price Index for necessities only. This rather simple and straightforward index will have advantages of pure price movements.

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One index versus two indexes

If any CPI measures price movements for necessities only, it is technically speaking a new CPI. What should happen to the existing one?³ The question here is whether or not an index for necessities only, satisfies the "all purpose" requirements. The simple answer is no because not knowing the trends in non necessities' prices means not knowing the trends in demands for these goods. But such trends are not an indication of inflation because demands for non necessities change and prices together change as well. However, a continuity of the non necessities' index might bring other benefits besides the traditional quote of the inflation rate. Therefore, this index should not just disappear.

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The CPI for necessities only, could solve the rate problem for savings and investments. But would such an inflation rate also apply to employment contracts and wages? From the CPI point alone however, there is a tremendous difference between savings and wages. Weights are the difference. From one year to another, wages of workers do not fluctuate much which means that most full time workers earn almost the same money in two subsequent years. They are a typical example of CPI expenditures - weights and (with an assumption of error) might continue to buy the same non necessities goods. If these workers spend 50% on non necessities and 50% on necessities, how should their wages be adjusted in

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³Just to mention that the weights of the existing CPI do not apply to savings but the weights of a new CPI would have to come from somewhere. The question of weights will come back later.

a case of 5% inflation for necessities and 5% deflation for non necessities? It seems at first that there is no need for an adjustment of wages since most workers make the same expenditures from one year to another. However, there is an issue of savings or a propensity to save. That percentage of income should be definitely adjusted. As a result of it, wages should go up slightly. But this is only a theory and it may not work at all in a real life. Paying 5% more for necessities could mean not having this 5% to pay for other goods since an adjustment of non necessities' prices might be strictly related to a lack of money and therefore, lower prices for non necessities do not reflect their cost and value. If on the other hand goods are bought on credit, 5% deflation for non necessities can be a result of shifts in demands for a better quality goods and measuring current prices of once highly demanded goods, might be an explanation for deflation which is in reality an obsolete data. So, there is a strong possibility that in a case of 5% inflation for necessities workers could demand a 5% wage increase just because price movements for non necessities are not a good indication of real prices and trends in expenditures. The great controversy however could happen in a case of inflation for non necessities and deflation or no inflation for necessities. If there would be no inflation for necessities but 10% inflation for non necessities, should workers receive a 5% wage increase?⁴ In this particular case the employers could make a point. The point is why would anybody knowingly pay higher prices for non necessities and then demand higher wages accordingly? Isn't it better to take more time and shop around for deals? The response of workers would be simple. They work hard for their money and everything they don't want to buy is cheap, but everything they do is expensive.

The controversy of wage issues goes beyond the scope of this project. The existing CPI could become vulnerable every time a noticeable discrepancy in rates between necessities and non necessities occurs. This applies to wages as well as savings.

Would then an inflation rate for necessities only, be sufficient for the purpose of wage negotiations? The intuitive answer is yes because it would only be a major indicator of the

⁴The 5% upward shift in an inflation rate instead of 5% deflation for necessities and 5% inflation for non necessities, helps to explain the controversy of wage increases better since the debate focuses on a 5% increase.

direction in wage adjustments, it should never be an automatic, full adjustment by itself.⁵ Also, the significance of necessities and their price movements is too prominent to treat it equally with non necessities. Above all, wage negotiations go far beyond statistical information and inflation. They consist of factors directly related to the performance of businesses and these factors might become the key issues of attention.

The most important reason why non necessities should not be measured for the purpose of an inflation rate is a scenario of higher non necessities than necessities' prices. As a result of it, the overall inflation rate would go above the necessity rate (assuming substantial expenditures for non necessities) adding to the cost of borrowing money. If people's demands go up which shows in higher prices then why should this add to the cost of borrowing money?⁶ The entire economic growth depends on the cost of financing. It is OK to measure price movements for necessities to protect the cost of living but it is not OK to protect the standard of living. Wouldn't the best alternative of protecting standard of living be through economic growth and prosperity which by itself brings a higher standard of living? Should concerns of higher prices for non necessities become a thing of the past?⁷

Weights for necessities

The above argument about necessities and non necessities has its **roots in weights**. Why in weights, here is an explanation. In 1938 expenditures on food accounted for 31% of Canadian family's total consumption. In 1967 expenditures on food went down to 24% of total consumption and in 1996 down again to 17%.⁸ Over the years weights for food are steadily going down and that creates a real problem. If for example visitors from another planet would

⁵An automatic, full adjustment is indeed appropriate for minimum wage jobs but not for high paid professions. However, that is true in a case of inflation because in a case of deflation, an adjustment of minimum wages for even lower wages (assuming no regulations) would cause labour disputes.

⁶How raising the interest rates in this case can be explained, is this fighting inflation or fighting demand?

⁷Is traditional method of fighting inflation too costly in today's highly developed world?

⁸Sources:

1. Dominion Bureau of Statistics, Prices and Price Indexes, 1913-1940, Catalogue no. 62-501, Table 22.
2. Dominion Bureau of Statistics, Urban Family Expenditure, 1967, Catalogue no. 62-530, Table 1.
3. Statistics Canada, Family Expenditure in Canada, 1996, Catalogue no. 62-555-XP B, Table 17.

The estimated numbers were calculated by applying 100% to the total current consumption.

come to visit earth, by reading the Canadian Consumer Price Indexes they could conclude that as time goes into the future, humans demand less and less food but more and more readings and recreation. Why they should draw such conclusions? Because if humans apply lower and lower weights to food, food automatically becomes less and less significant price movement to them. **That's wrong.** Price movement for food is the most significant price movement now and in the future and therefore, food should always have the highest weights. That's why an argument about necessities and non necessities has roots in weights since the continuation of an existing methodology could bring even lower necessities' weights in the future. But in order to apply the highest weights to food, weights for other goods must come down or some goods must disappear from the index. Non necessities will disappear to give the way to necessities.

Where should the weights for necessities come from?

The existing application of the CPI weights is based on the surveys of family expenditures. Higher expenditures on goods reflect in higher weights for these goods. This method can be called an **expenditure factor** method since weights purely reflect expenditures. The problem with this method is the growing standard of living which ultimately results in lower weights for food as already mentioned. However, the expenditure does not mean the cost. If for example people spend more time with their computers, the overall hydro bills will go up since more electricity is used but the cost of electricity expressed in kilowatt-hours may remain the same. With respect to necessities the cost is what really must be known in application of weights. It also means that for the purpose of weights, consumption of electricity should be narrowed to necessities' consumption using electricity's cost as a base. By doing this all non necessities' weights are eliminated. This approach can be called a **cost factor** method.

However, the demand for necessities has specific time constraints. Should the time also be taken into consideration? If the answer is yes then how to account for time when the demand for all necessities has equal time constraints which means that physiological needs do not discriminate or that the recognition of a lack of any need automatically triggers demand for that need? Even though the demand for all necessities is equal with respect to time, necessities by themselves are not equal. Why food is a number one necessity, becomes obvious just by going back in time as far as possible, as far as the beginning of human's existence. Why electricity is not a number one necessity also becomes obvious by going back

in time. This simple exercise is a good guidance in defining the difference between deep core and shallow core necessities. It can be used for all necessities. So, to take time into consideration when weights are concerned, the length of time of existence of any particular necessity should be an indication for the weight. This is a **time factor** method in application of weights. Deep core necessities should therefore have higher weights than shallow core necessities.

If the cost and time factors answer the original weights' question, this still doesn't tell how to combine these factors together. The problem is that it is impossible to do it right for two reasons. First, it is easier to numerically apply weights according to the cost of necessities but it is very hard to establish the time factor or a significance of any necessity and then numerically apply the weight. To say that in other words, how much more important is food than electricity? Second, if such importance can really be established, how then a time factor should be combined with a cost factor? What's more important, the cost or the significance of a necessity or, are they perhaps equally important? How should these relations be expressed numerically?

There is no solution to this problem but it doesn't mean that the time factor should be excluded to make it simpler and accurate. Why the time factor is significant becomes evident in the following composition of weights for necessities. These weights are **only intuitive** application of numbers to the cost and time factors. Both factors are treated equally.

Food	37%
Shelter	30%
Clothing and footwear	14%
Transportation	8%
Hygiene products	2%
Semi necessities	9%

The most noticeable thing besides the numbers is the inclusion of semi necessities in the necessities' weights. Now it should be clear why the argument about necessities and non necessities excluded semi necessities. Semi necessity goods such as food items are included in a food component but those independent ones such as watches and wallets are included in

their own component. This is a necessity index after all because most semi necessities belong to the necessities' components. That's why they are called semi necessities. Only 9% weights are assigned to other semi necessities.

Water, electricity and natural gas are included in the shelter.

With respect to cost and time factors, there is no further justification of the weight numbers assigned to necessities. However, "major components" will reveal more about necessities and why a particular necessity weight number might be appropriate in comparison with the other necessity weight number.

The above weights could remain for as long as there is no further creation of necessities otherwise, they are only a temporary solution to the problem of growth in necessities.

MAJOR COMPONENTS

Food

Is 37% a high number or a low number assigned to food? This number might be just about right because Canadian winter causes shelter's weights to go up. Shelter in Canada is almost as significant as food. In warm climates the shelter's weights could be lower but the food's weights higher. The climate addresses only a cost factor because the time factor is identical for food and shelter. It means that every human would like to consume three meals a day, every day, and sleep approximately eight hours every day. Food, shelter, clothing and footwear are the deep core necessities. All together, they take a very high percentage of the total weights.

So far, three types of food groupings have been introduced. The first type includes semi necessities such as bread, eggs and milk. The second type includes beef, pork and chicken which are non necessities. The third type was mentioned only once. It includes lobsters, oysters and caviar. Those three groupings are sufficient to explain what food as necessity really means. Food simply means a daily survival. Lobsters, oysters and caviar are therefore not only non necessities goods, they are luxurious goods. Their high prices partly explain the reason for the term. The other and the real reason for these goods being known as luxurious lies in quantities available to consumers. These goods are scarce to begin with and therefore are not a part of the daily meals. That's because they are only supplied by people,

however they are produced by nature. Nature does not produce enough for everybody anymore. It also means that people or suppliers of these goods don't have a total control over future's quantities produced. Changes in supply of these luxurious goods can further affect demand and prices. As mentioned earlier, a pure price movement concept assumed monetary policy and supply of goods to be all right. The significant lack of human control over renewable natural resources makes the entire fishing industry unsuitable to satisfy the concept of a pure price movement. For the purpose of measuring food prices as necessities, seafood goods should be excluded.

The remaining two types of food groupings also don't satisfy the concept of a pure price movement since according to the demand theory, only the food does. That's correct but unlike expensive seafood goods, these goods make up the daily meals. The composition of daily meals does not necessarily change over time. This means that statisticians could tell without a reference to surveys what people eat for breakfast. Coffee, tea, juices, muffins, cereals, pancakes, waffles, eggs, bacon, ham and toast would certainly be identified. What are the chances of these goods disappearing from the menu if they have been part of the menu for a long time? In other words, longer and longer the goods make up the daily meals, more and more of necessities they become. There is a chance that some items could disappear once and for all giving room for a better, healthier food products, however, it is practically impossible that all of the sudden consumers forgo the consumption of all existing breakfast goods in favour for other goods. In time therefore, the composition of a breakfast meal does not change much. It might not be quite the same with lunch and dinner meals since consumers' incomes determine how much beef, pork and chicken will be consumed. But if the quantity consumed is not affected from one period to another even if there is a change in prices of these goods or a change in consumers' incomes, it simply means that the change in prices or income reflects a change in expenditures on other goods because there is a strong taste preference for beef, pork and chicken. In such cases, it could be possible to measure the price of daily meals since the consistency of quantities is not affected by any other variables. If on the other hand there are significant shortages in supply, the composition of meals would change but unlike the seafood, people produce and supply beef, pork and chicken and therefore have almost a full control from the beginning to the end of a supply process. The total control in production cannot be achieved in grain products because of the dependency on weather conditions.

However, the price of bread is low and the demand does not disappear. It seems therefore that a compromise must be taken in order to measure pure price movement for meals. In reality there isn't a pure price movement just by itself because it wouldn't be a one in a first place if everything else remained constant. But the trick here is to know the factors causing prices to move and whether or not it is possible to deal with them.

Price movement for meals is an alternative to price movements for food. It eliminates many intangible variables which are characteristic to the consumption of food with relation to the standard of living and focuses on a necessity aspect of price movements. It could be used as an absolute price reference since such price reflects interests of everyone at all times.

It should be obvious that consumption of meals in restaurants is not necessity consumption. Even if consumption of meals in cafes and restaurants recurs at every lunch break, the continuity of such consumption is not sufficient condition to consider this a necessity because, eating out has no time constraints whatsoever. Eating out therefore should not be measured in a necessity index.

Prices of fruits and vegetables available only seasonally can be measured because once they become available, consumers take advantage of it and for that specific period of time, adjust the pattern of daily meals.

Special care should be given to agricultural subsidies. Subsidies in general have political foundations of keeping agricultural industry on a solid ground. The real issue is not so much about subsidies but a rate of change in price of any particular product as a result of a rate of change in subsidies from one period to another.

Only main issues were mentioned in a food component. The complexity and volume of the technical and practical aspects of the methodology make it hard to go into further details and that's why only a general idea has been introduced. Everything else might be left as it is.

Shelter

What is location, location, location? It is a standard of living because there aren't two identical locations. Location therefore has always been a crucial identifier of that standard. Location on the other hand has nothing to do with shelter. Shelter means a place to sleep, a place to rest. It doesn't mean home, a backyard or real estate ownership. If the demand for a

place to sleep does not change but the demand for location does, then how to measure inflation with respect to shelter as necessity when every shelter must have some location? The only solution to it is an exclusion of land from shelter. This leaves with construction costs of the shelter which are the only indicators of inflation. The inclusion of land could lead to pure price movement errors since it is impossible to account for an impact of drug dealers coming into and going out from the neighbourhoods on price movements or, an impact associated with employment opportunities in certain geographical areas. The exclusion of land will not reveal the true, full cost of shelters but this is not what measuring inflation is all about. It is about measuring a rate of change. What must be known in this particular index is the rate of change in the price of shelter as necessity but not the rate of change in the standard of living.

The best way to find out about shelters' construction costs is at the new home developments.⁹ All costs are combined together and add up to a single price of home. A home or a house is what people buy. They don't just buy a shelter. This means that new homes could include swimming pools, recreation or exercise rooms. Changes in prices of new homes could come from changes in non necessities' costs. The way to deal with it is to eliminate ornaments and concentrate on bricks and mortar. Bricks are bricks whether they are used to build the bedroom or recreation room. It doesn't mean that an Industrial Product Price Index should become a better reference to construction costs, it means that the price of shelter, not a price of home should be defined. A construction industry uses a jargon of "square footage" to define construction costs. Such reference applies to any size of the shelter and could be a better alternative in tracing costs.

Because shelters are durable goods, only few people move-in to new shelters in any year. This creates a technicality problem because a total inflation rate for the shelter component is derived from only few prices of new shelters. It must be mentioned that what is really being measured here is actually a rate of change in opportunity cost for everyone living in current shelters. Those shelters will eventually deteriorate to the point that they are no longer suitable for use and prices of new shelters should therefore be everyone's interest. Someone may want to make a point that the deterioration process is slow and a life expectancy of a shelter is greater than a life expectancy of a human and therefore, prices of

⁹A definition of home as a shelter includes apartment buildings, detached and semidetached houses, but it excludes seasonal and recreational properties.

new shelters might be of no concern to a person who has recently moved-in to a new shelter. That is partly correct with two major exceptions. First is that an opportunity cost is continuous and no concerns to any particular individual might become some or even great concerns to his/her children and grandchildren. Second, employment opportunities become global and a job hunt no longer focuses on a neighbourhood and vicinities. That's why knowing the prices of new shelters should be everyone's either direct or indirect interest.

Measuring opportunity cost explains the rationale of the concept but it still does not deal with a problem of so few numbers for so many, 30% weights. If 7% of these weights can be assigned to water, electricity and natural gas since they are supplied to homes, then remaining 23% are construction costs. What if there are no new home developments in a certain year? The only solution to it is leaving the inflation rate for shelters blank or read it as zero inflation. In a case of very few developments, only low weights of 5% to 10% for example may be applied. The 23% weights are appropriate if enough data are available to have a view of the entire picture. But the whole thing can still be controversial because prices of new homes (technically speaking) dictate the entire inflation rate for the shelter component. The only alternative to offset an impact of such data is to change the significance of shelter from 23% to for example 10% in the necessity index and redistribute 13% weights elsewhere because the next best alternative is not to measure shelter at all. It should be stressed one more time that the concept of shelter is a very unique one since it separates land from a building. The inclusion of land leads to errors because location is not necessity.

Clothing and footwear

Clothing and footwear is quite simple comparing to shelter. The line must be drawn between necessity and fashion and that's all there is to it. It may seem difficult since all new clothes are fashionable, conceptually however it is not because it's easy to understand the difference. Since all new clothes are fashionable, drawing the line becomes a challenge. The objective here is not to eliminate fashion completely but rather to identify fashion. If some clothes and shoes are worn on a daily basis, they can be considered necessities or precisely speaking semi necessities. If a dress for Saturday night is not suitable for any other day of the week, it is not a necessity dress. But the real challenge begins with professional attire, necessary in today's workplace. The only way to find out how to deal with this issue is from surveys since

people's intuition could be the best indication what they understand by necessities and what they want to be measured. Because the issue of professional attire might be controversial, lower time factor weights (in comparison with deep core clothing and footwear necessities' weights) might be applied here. The 14% weights in a necessity index which seem to be high in relation to transportation's weights, also reflect physiological changes happening to humans until the age of maturity.

All sport's and recreational clothing and footwear should be excluded from a necessity index. All jewellery and other decorative items should be excluded as well.

Transportation

Why transportation's weights are so low (only 8%) can be justified by explaining what transportation as necessity really means. Transportation in general is a method of relocating people and merchandise from one place to another. Transportation as necessity is a relocation at specific time constraints. But transportation as necessity also means that the primary objective of transportation is relocation, therefore, transportation in this respect is not a time saving device. But what really transportation in today's world is? It is a major technological progress affecting enormously the standard of living in every household. Why then the weights are so low when expenditures on transportation are increasing? The weights are low because the basic needs of people don't change.¹⁰ What people really need, is a vehicle to relocate them from homes to the place of work but what do they get? They get air bags, ABS, power steering, radio and much more from the technological paradise. Is automobile industry of the private sector unsuitable to satisfy the concept of a pure price movement? The answer to this question cannot be given alone because in order to do that, other topics including public transportation must be discussed all together.

Transportation is a transition from a deep core to shallow core necessities.

Transportation does not universally serve the purpose for everyone since seniors who may stay most of the time at home, or children who have (technically speaking) a walking distance to schools do not require transportation to the same degree as working adults. But even working adults use different means of transportation. Some of them prefer private

¹⁰Just to mention that transportation of merchandise is excluded because this is CPI and only the basic, physiological needs of people are considered.

transportation, but others prefer public transportation. The preferences for private transportation where public transportation is available reflect to the great extend a standard of living. The cost becomes a secondary issue since convenience and time savings take a main objective. But on the other hand, public transportation is also convenient and saves time especially in large metropolitan areas. On top of that, public transportation gives the very basics of transportation excluding all diversification of products the car industry offers to individuals. It seems here that public transportation is the one which should be considered as necessity since it can well and uniformly satisfy the fundamental needs of many without any individual bargaining for price and product position. This might be considered true as far as large cities since the demand for such transportation will not be significantly altered even at the growth in standard of living because of congestion problems in cities, however, it is not true in small towns and remote rural areas. Private transportation is the only one there. The problem of defining private automobile industry as necessity lies in the continuous growth in technology. If a car can be considered the basic mean of transportation in Canada just because it is affordable and because there aren't any others, so commonly identifiable means as cars, then what is an affordable bicycle in China? Is it a necessity or recreation device? Because the main feature of necessities (beside specific time constraints for their demand) is a lack of substitutes, to what extend can a bicycle in Canada be considered a substitute for a car? To what extend fluctuations in car prices affect demands for bicycles as far as the concept of a cross elasticity of demand? Not much or hardly at all because the demand for cars is not so much a demand for necessities but a demand for a standard of living. Why this statement is correct, can be verified from living habits of people. People in general prefer to incur the costs of transportation just to be able to live in their dream homes once such homes are found. People or working adults do not locate close to their jobs and relocate every time new jobs are found. To say that in another way, the demand for standard of living creates necessities and transportation is a very good example of it. Transportation is not a deep core necessity.

The above argument only explains why the percentage number for transportation' weights is low but it does not tell what should be really measured and how. The reason for it is that transportation is the most difficult component of all just because it is hard to define as necessity and because technological progress by itself creates necessities. For practical reasons, both private and public transportation should be measured. There is no golden rule as

to the methodology therefore, an assumption of error must be admitted. In general and with respect to pure price movements, only deep core necessities are relatively easy to measure because further away one goes, a higher probability of errors occurs. This underlines that measuring price movements will never be perfect due to complexity of the concept. Applying low weights to transportation is also a way to minimize an overall error making the entire inflation rate a more reliable source of data.

Hygiene products

Hygiene products component is similar to clothing and footwear. The line must be drawn between hygiene products and cosmetics. Low weights reflect mainly low expenditures on these products. Due to a striking similarity between this component and clothing and footwear, no further comments are included here.

Semi necessities

These are actually new necessities which haven't been included in the index yet. They became necessities as a result of growth in the standard of living. The surveys of family expenditures can identify what these goods are. If 95% of population or more have them, then these goods should be measured. The surveys should also ask which goods people think should be continuously measured and which can be skipped. If for example most households have television sets but there is a great chance that the technology of television might be combined with a computer industry, people may not be concerned with the current TV prices. On the other hand, they may want to know the prices of refrigerators on continuous basis since there isn't anything new coming in the refrigeration industry which in a near future could substitute current refrigerators completely. But there is one thing which shouldn't be asked from people and that's an application of weights to those measured goods and the application of weights in the entire index. The problem could arise once people start applying for example 30% weights to this (semi necessities') component just because they think of the goods as expensive. This would create a problem of giving more weights to semi necessities (or shallow core necessities) and at the same time, taking away weights from deep core necessities. As a result of it, price movements for refrigerators for example would start becoming relatively more significant than price movements for food if the refrigerators'

prices keep rising on continuous basis but food prices don't. This would result in going back to a current system of applying an expenditure factor into the weights.

However, the biggest concern about the semi necessities' component lies in the problem of growth in necessities. The weights in the necessity index do not address this problem. They only show how differently understanding and measuring inflation can be. The continuous growth in necessities would force an adjustment of weights in the entire necessity index. That's why weights are so crucial in the entire methodology and will probably receive a great focus of attention in the future.

Non necessities components

This section explains very briefly why certain components are not considered necessities and why they are missing in the necessity index.

Health care

It might be the most controversial issue whether or not health care is a necessity. Once people get really sick, the physiological needs for a cure become the most essential needs. In this respect health care can be considered necessity. There are many reasons why it is excluded in the necessity index. A very practical reason is that health care in Canada is provided at the public not a private sector which means that consumers pay only a small portion of the entire cost from their after tax incomes. The inclusion of even a small portion of private expenditures on health care in the necessity index could create misunderstanding what inflation really is. In the case of no overall inflation, could inflation for health care alone be a reliable signal to raise the interest rates? The science of health care becomes more and more a science of immortality. How should the demand for immortality be assessed with respect to money? Fear of death creates demand for health care, but fear is a very psychological, not physiological feature. Also, expenditures on health care do not only occur at the time of sickness but they have a preventive approach and that makes the difference in individuals' wants. The demand for health care therefore is easy to define at the time of sickness but it is not during the health of individuals. The biggest reason why the cost of health care should not be measured at all is the direct contribution of technology into the benefits and progress in health care. Because of that, the entire cost of health care is

immeasurable with respect to benefits derived from it.

Education

It is not a necessity since there are no physiological needs and no time constraints for education. If all kids start to go to school at the age of seven, it does not explain why they don't do so at the age of ten. Education is very habitual and intellectual aspect of life. It reflects a standard of living.

Household operation and furnishings

Certain items as beds, sofas, tables, chairs, appliances and few others might be included in the semi necessities' component. Overall, these goods are rather expensive but they also have long life expectancy (25 years for appliances). Because of that the weights are low and there is no need (in this project) to include these items in a separate component. It must be mentioned that many people buy new furniture from a perspective of interior home design and fashion even though still having used ones to serve their basic needs. These types of buying habits are nothing more than a marginal demand and they should be taken into consideration. The rest of the household operation and furnishings component includes non necessities.

Readings, recreation, tobacco and alcohol. These are clearly non necessities components.

SUMMARY

The Consumer Price Index part and even the demand theory were barely introductions. Only the key issues were introduced to create a framework for more analyses. There might be thousands details there which need to be worked out and explained. But the focus of the entire project was on a main idea, an inclusion of time in the demand theory and applying that theory into the CPI. This gives new foundations for further studies by economists and statisticians.

As the demand theory showed, analysing three variables brought new arguments and new results. If in the future economic analyses more variables can be included, an understanding of demand will flourish. Psychological features such as fear, greed, jealousy, ignorance or fun might be in some cases the most prominent ones affecting demands and they should not be ignored. It seems that analysing all at once in some economic concepts might be the better way to go than analysing only certain fragments and keeping everything else constant. The complexity of demand cannot be explained in the graphs and therefore the demand functions together with language should be looked as the new tools to do so. As far as the CPI, there is much more to the concept of price movements once the demand with respect to time is introduced. **There would never be a problem of inflation without time constraints for necessities.** People could simply fight inflation just by waiting for all prices to come down to a desirable level and buy when the price is right. Necessities don't allow that. Because of today's highly developed and technological world, drawing the line on necessities is the most challenging task. However, it can be done and it must be done. Once it's done correctly, the Consumer Price Index for necessities only, can be the most reliable source of data for quoting the inflation rate.

Is there anything else which hasn't been mentioned yet but seems to be important? The answer is the actual inflation rate for necessities. But why such an important matter was omitted? There are two reasons for it. The current methodology of collecting information does not draw the line on necessities. In some cases it can be controversial what necessities are and only a mutual agreement of the public at large can identify the desire to measure or not to measure certain goods. But in order to do that, very different surveys and questionnaires have to be issued to consumers. This is rather a minor reason why the actual inflation rate

hasn't been quoted. The main reason is that it is not important what the actual necessities' inflation rate is, but what it is going to be. Inflation was always understood as the overall upward price movements for all the goods and services produced in the economy. But if the new definition of inflation can be restricted to necessities, how differently can this affect the notion of the problem of inflation? Monetary policies of the central banks directly deal with the problems of inflation. As far as the current understanding of inflation, these policies are successful in Canada and United States in particular. Because problems of inflation are problems at the national levels, an actual inflation for necessities will only maintain current or launch a new policy to deal with inflation. That's why the future's inflation rate at continuous basis is the best test for any policy. How quickly can any policy be implemented and when it will become effective is another question.

Is it possible to have zero inflation for necessities once and for all?¹¹

Because the significance of necessities was emphasized throughout this project, references to goods, not services had been made. Unlike services which require mostly human resources, production of goods requires human and capital resources. With the exception of water, fresh air and sun, most necessities must be produced using available capital resources. To even consider zero inflation for necessities, one very important condition must be met. **The economic concept of scarcity must never apply to necessities.** If this condition is not met then somebody might be inclined to say that the cave man and cave woman were better off than a modern human since they had enough of everything they needed to live. In different terms this condition can also be read as comfortable abundance of human and capital resources to produce necessities on time and on continuous basis. As probably noticed, this condition addresses only the quantity aspect but not the cost aspect of necessities and at the same, alters the definition of the concept of scarcity. Because economic goods are those which are scarce, they cannot be provided free. But is it appropriate to say that not free means scarce? There is no doubt that lobsters, oysters and caviar are scarce goods because no matter what people might be willing to pay for them, there will not be enough for everybody if nature, not people produce them. The real issue therefore focuses on capabilities of

¹¹Monetary policies are designed to deal with inflation. This section examines whether or not it is possible to prevent inflation.

productive resources to satisfy everyone's needs at the willingness to incur the cost since cost becomes a subjective matter. The biggest problem of scarcities in necessities lies in resources. The best example of it is mining. Recent attempts to utilize the solar energy is the right way to go since solar energy is a renewable source of energy. What all of this means in terms of scarcities in necessities is a going concern about capabilities to sustain long-run production of necessities based on available resources. Once humans become confident of having significant control over long-run supply of necessities, then they may expect only modest price movements of the productive resources or not expect any price movements at all.

However, it also requires human resources to produce goods. Scarcities don't really apply to human resources in a traditional economy. Unlike the rocket science where knowledge and expertise might be hard to find, shortages of labour in a traditional economy can be quickly overcome by learning on a job and apprentice programs. These shortages can also be forecasted and appropriate actions taken a head of time. Therefore, the issue of rising prices for necessities as a result of rising wages cannot have roots in shortages of labour. There are other reasons for it. The most common one is a bargaining for higher wages. Such bargaining whether collective or individual, explicit or implied (quitting the job because of low salary) has very psychological and economic roots. It can be called an opportunity cost for the value of work. It means that higher wages for the same job paid in different company attract negotiations. But it also means that certain well-paid professions attract a workforce. More well-paid jobs are created for example in the technology sector, keeping young individuals on the farms becomes harder unless they can earn more. This rising opportunity cost is a problem and is perhaps the best explanation of wage hikes. So, here is another condition for no inflation; **an opportunity cost for the value of work must never go up.** It seems that the problem of inflation may persist because in today's world the technology sector is booming and the foreseeable future for this industry is bright.

This is right in one sense and technology's jobs are indeed well paid. However, it doesn't necessarily mean that the technology sector drives the opportunity cost. An opportunity cost addresses everything. By everything it means: hard work in elementary and secondary schools to obtain good grades, undergraduate and graduate education including students' loans, postponing marriages and other private affairs to obtain education first, downsizing, restructuring and other corporate affairs, reacquiring new skills on continuous

basis to keep up with progress and technological innovations, disappearance of nine to five jobs, disappearance of job security and, at the very end comes demand. Demand for non necessities goods at the consumer level is unstable which also causes a loss in job securities.

But what is the real reason for such unstable demand? The reason lies in **absolute time constraints for consumption**. By absolute time constraints it means that nobody can extend 24-hour life cycles of humans. On average, it takes eight hours to sleep, another eight hours or even more to work, some extra time for meals, daily hygiene, transportation and after all, there is not much time left for anything else. Even though, sometimes consumption cannot be precisely defined with respect to time (a good example of it is a satisfaction derived from paintings and other decorative products), the issue of time constraints remains in all cases where the time to consume a product can be defined. In terms of unstable demand it means that consumers have many alternatives but not enough time to consume everything they would like, even when their budgets allow to do so. This leads to making choices and demanding higher quality, better products all the time. In economics the focus had always been on budget constraints but not much if hardly at all on time constraints. The budget constraints can be overcome by borrowing money. Nobody however can borrow time in a real sense of the meaning. The exception to it is the fact that people live longer because they succeed in taking care of themselves but the 24-hour absolute time constraints are there and it's impossible to do anything about it.

All of it relates to opportunity cost for the value of work in a very direct manner. Taking everything into consideration, it is not clear to what extent such opportunity cost may have an impact on upward price movements in a near future. Even if the economy can keep producing more using recent technology and innovations, the consumption is often limited by absolute time constraints. Isn't the 1999 overall inflation rate some reflection of that?

The answer to the original question of zero inflation for necessities once and for all is yes. However "yes" only implies that it's possible. It means that unlike traditional method of fighting existing inflation, it is possible to take a pro-active approach to prevent price movements for necessities right from the beginning. The pro-active approach seems achievable when dealing with capital resources but it might not be so easy when dealing with people. The psychology of human behaviour is immeasurable and only absolute time constraints for consumption can keep opportunity cost of work stable.

The new problems associated with measuring the CPI's inflation rate based on the demand theory with respect to time, have now been revealed. As discussed above, the main solution to these problems was the introduction of the necessity index. We shall now explore the mechanisms of the summation formula with regard to the necessity index. These mechanisms are based on weights which are the frames of the entire method. In the context of these weights we shall examine once more and fully justify some original ideas and also introduce new ideas. The justification of all these ideas might be seen as a creation of foundations for the new way of measuring inflation. Because of the complexity and nature of some arguments which don't fit directly into the foundations of weights, additional sections are included after the main discussion.

COST FACTOR AND TIME FACTOR

Estimations

In order to come up with initial weights for the necessity index, precision and accuracy must be disregarded but estimation and judgement used instead. This refers to the cost factor as well as the time factor. The following two arguments address both factors. The first argument is about food and the second one is about shelter and transportation.

The time factor

As mentioned earlier, the length of existence of any particular necessity should be an indication for the weight. Such length can be estimated with reasonable accuracy for shallow core necessities. However, deep core necessities (food in particular) create a problem. The problem of applying a time factor to the food component in a precised manner lies beyond the validity of historical data. The problem lies in the number itself and that is the size of it. By applying such a number in biological terms, price movements for semi necessities could become so insignificant that measuring them wouldn't be worth it. The length of existence of food as a necessity must therefore be referred to in terms of economics. It begins with an exchange process of food goods and goes into a reliance of some, on a production and supply of food by others. This reliance has been steadily growing over the years and the total contribution of agriculture industry measured as a percentage of GDP is declining.¹² To say it in a different way, price movements for food wouldn't be an issue (or they would never exist) if everybody could live directly off the land and no one would rely on food production.¹³ Therefore it is appropriate to say that the beginning of the reliance of some on food production is the beginning of creation of food as a necessity in terms of the significance of

¹²It only means that price movements for food are now significant to all people, it doesn't mean that such significance is increased/decreased every time the number of those who produce food for their own consumption changes because in some point in time they all may want to stop doing it and pay others to produce food for them.

¹³This also explains why the demand for food cannot be perfectly inelastic but has time and quantity as the only variables. Since semi necessities have an inelastic demand curve then the demand for food should be perfectly inelastic since if people cannot live without food, they will pay any price for it. However, at continuously rising food prices people will start going back to the land and live off the land. They will become suppliers of their own demands.

price movements. However the difficulty here is to prove that such a point in time must be an absolute time reference for a length of existence because at that time food price movements are only significant to those who completely rely on food production, although they (price movements) should be significant to all people. That's why it is practically impossible to come up with an accurate figure for the length of existence of food. But the problem does not end here. The length of existence of deep core necessities is needed also to define the difference between them and shallow core necessities. The reason for it is that every human cannot live without deep core necessities, but can do so without shallow core necessities, and that's why such a sharp distinction should be defined. However, since the existence of shallow core necessities can be related to the phenomenon of an industrial revolution, the question remains whether or not such a revolution could occur at some times earlier or some times later. If the answer is yes, then the time period between the beginning of the reliance of some on food production and the industrial revolution is not an absolute indication of growth in complexity of human lives because it doesn't stand as a necessary time period required for all the changes to take place in order to structure civilizations towards industrial revolution. Another concern in defining the difference between deep and shallow core necessities may come from the simplicity of producing deep versus the complexity of producing shallow core necessities. To say it simply, without further elaboration, every human alone can go back to the land and be able to produce food, but no human alone is able to make a car. This certainly narrows the gap between deep and shallow core necessities but the numerical aspect of it is still unknown. The entire argument now comes down to the essential question of how to apply a number to deep core necessities with respect to the length of existence if there isn't anything solid to build on, and why bother with a time factor in the first place. It is however not so bad as it seems to be. As mentioned earlier, the length of existence of shallow core necessities can be estimated with reasonable accuracy. This can also be done to transportation and hygiene products. On the other hand food, shelter, clothing and footwear have identical time factors. So, there is only one major estimate needed and that is a ratio or a relation between deep core necessities and the rest. This estimate is actually the very first one and the most difficult one. It all becomes easier in subsequent steps.¹⁴ But that's only a technical

¹⁴Even though there is no magic solution to this problem, later a practical application of the time factor to deep core necessities may help.

aspect of the matter. The existence of the time factor is necessary for two main reasons. The first reason is that determining the length of existence for deep core necessities might be the only difficulty for time factor weights, but this difficulty should not be overshadowed by the benefits the time factor gives. By benefits it means that the time factor weights are an excellent solution for the future because in terms of the creation of new necessities, there will not be a creation of more deep core necessities and the newest necessities can only be seen as more shallow ones to the already existing shallow core necessities. This notion can be supported by a simple example which proves that time constraints are not equal. If the Internet will ever become a necessity, then it is based on an assumption that other necessities are still going to be around. It means that the Internet cannot run without a phone line and electricity. It also means that with respect to time constraints, every consumer must have money to pay first for the shelter, then hydro and phone bills and then the Internet bill. All of this means that the longer the existing necessities are around, the more attractive they become as a basis for the creation of new necessities, and that's why their length of existence is so significant. The second reason for the existence of the time factor lies in the nature of a cost factor. The cost factor should not exist without the time factor. This has a lot to do with estimations. The following argument explains what a cost factor really is.

The cost factor

If one could think that estimations of the time factor are harder than estimations of the cost factor then the answer is wrong. The difficulty with the cost factor is that it has to eliminate expenditures for non necessities and come up with expenditures for necessities to determine the cost of living, and that is a very hard task. The following references to shelter and transportation will show why.

Because the concept of shelter is confined to a place to sleep with some very basic household operations, it would be contentious to define the minimum size of shelter one needs to live in normally. That's not everything. The construction costs of new housing developments are needed to measure inflation, but the shelter's weights do not necessarily have to reflect pure, initial construction costs because such costs are usually not incurred all at once. A shelter's weights could instead reflect rental payments or rental values since this way the significance of price movements is addressed from the expenditure perspective. To say it

in different terms, shelter prices would never be so significant if shelter's expenditures (reflected in rental payments) could be ten times lower than expenditures for food. Therefore, it is necessary to separate land from a building for the purpose of measuring inflation but it is not for the purpose of applying cost factor weights. But even rental payments don't solve the quantity issue of the minimum size of shelter needed. This can only be done by estimation.

Determining transportation costs has to be done by elimination of expenditures for pure pleasures. However, this doesn't solve the problem of a distance. It is hard to say what the distance should be, whether people should have the same, shorter or even longer distances to get to work, since necessities' expenditures based on a minimum distance are the foundation for weights. That's why changes to a distance might be seen as changes in the cost of living or standard of living.¹⁵ Also, the distance does not address a past, present, nor a future, since it can be nothing more than evidence of standard of living. This creates a question of what a cost factor really is. With respect to transportation, it might be said that it is simply a minimum, necessary but reasonable cost to satisfy basic, physiological needs of overcoming a distance. The distance therefore is an estimation of a minimum but reasonable length between home and a place of work, including consideration for infrastructure.¹⁶

The examples of shelter and transportation show that a cost factor is an estimation of minimum costs necessary to satisfy basic, physiological needs, but it still doesn't tell why the cost factor should not exist without the time factor. This will be explained by using food and transportation components as an example.

If initial weights for food and transportation could be the same and if (as a result of growth in technology, not inflation) a price of a standard car goes up, and if a cost factor is the only base for weights, then someone could think that the transportation weights should be increased (if a standard car is practically defined as a necessity) because the significance of price movements is reflected only by the price of a car/cost of a car (if all other expenses are constant). At higher transportation weights, price movements for a transportation component would become more significant than price movements for a food component. There are lots of problems with it. First, it simply doesn't sound right when price movements for any

¹⁵It is OK to say that certain distances are too short if the price for it is an expensive location (standard of living). Therefore, some longer distances might be seen as minimum distances.

¹⁶It means that because of today's infrastructure people can no longer walk to work.

component become more significant than price movements for food. Second, higher prices for cars could result in lower overall expenditures for cars by a decrease of the distances travelled. This has the same effect as waiting for prices to come down to a "right price" level. The final result could be a deflation for cars at higher than original weights. Third, since an increase in a price of a car has been a result of technological improvements, then any deflationary price movement resulting from timing is really a non necessity price movement because technological improvements are non necessity improvements. Fourth, a higher price of a car should be matched by a growth in savings and investments. If this condition is not met, then future expenditures will most likely not affect food, but will result in lower expenditures for cars. Because of that, the significance of price movements for food is not properly addressed in weights. Fifth, if the transportation industry can come up with a vehicle which fits between a car and a bicycle, and that vehicle might soon become a practical necessity, then this should result in lower weights for transportation. From the point of savings and investments, the significance of price movements for food suddenly increases, but the composite inflation rate over a period of these savings and investments did not take such a sudden increase into account because a car was assumed to last as a practical necessity. Finally, an adjustment of the major components' weights due to periodical changes in expenditures/costs and inflation is undesirable.¹⁷ The objective of the cost factor is to assess significance of goods by using their costs as a guidance in measuring price movements. It is not an absolute reference to cost because the foundation of the cost factor for transportation is not the cost, but a distance.

This takes back to the time factor and an explanation of why it should be included in weights. The cost factor is only an estimation for the cost of living. By itself, it doesn't tell much about the significance of price movements because as in the transportation example, the price/cost of a car was directly linked to a growth in technology, which means to the standard of living. Such growth contradicts the notion of minimum, reasonable costs to overcome a distance. Therefore, the significance of price movements with respect to the cost factor only, cannot be adequately expressed using an estimation approach because the final results might be too spread out if there are some who believe that a bicycle is, to some degree, a substitute for a car and therefore see almost the entire transportation component as a non necessity one.

¹⁷This will be discussed in details later.

The inclusion of the time factor helps focus estimations of the cost factor in the right direction. It gives weights where they really should be, and takes away where a definition of necessity is vague, allowing for a wide range of cost alternatives. The time factor is a good tool in assessing significance of price movements.¹⁸

The way it works

The initial problem of applying time factor weights does not end at necessities. The problem extends to the non necessity goods falling into necessities' components, such as food for example. It is to some degree unknown what food consumption looked like in the far past, if such data is needed to track a length of existence of food goods. Since non necessities goods may disappear in time, all food goods regularly consumed today may have different time factors. Therefore, the length of existence of today's goods might be a big question. Such length is needed for the summation purpose to come up with a total time. The total time is then needed for redistributing weights in percentage numbers. However, if some food goods become a part of the daily meals, but only in an irregular manner, then establishing the time relations between these goods and regular goods is very difficult for two reasons. The first reason is the length of existence of regular goods and the second reason is the irregularity of consumption of new goods. The argument about estimations for necessities now comes to non necessities. To avoid repetitions in a similar manner, the weights for food goods are also only a guidance in assessing significance between them and they don't address an absolute time reference.¹⁹

Since non necessity goods can disappear in time, then in theory, none of the food products/goods consumed today could be present in the far past. Therefore, the establishment of the time factor for food component must be independent and cannot refer to the length of existence of today's goods. Because (together with shelter and clothing and footwear) it is also the most difficult application of a number in the entire weight system, there should be something to neutralize the impact of inadequate data in terms of a length of existence. One

¹⁸In the "Relative cost and chronological order of expenditures" section there will be a major explanation why the cost factor and the time factor are inseparable elements from each other. The explanation given here is characteristic to estimations only.

¹⁹There could be much more coverage on this subject but then the entire argument would become quite statistical. The objective of this paper focuses on economics.

solution to it is classification of the entire time factor weights into two segments: deep core necessities and the rest or deep core necessities and shallow core necessities. The following two-scenario example explains why.

5 Scenario #1

If transportation and hygiene products' components can be classified as semi necessities or shallow core necessities, and if further classification for semi necessities components can be made (as for example to appliances and communication), then there could finally be a total of ten components in the semi necessities' segment. Because application of
 10 the time factor is based on a length of existence and all components are deemed to be independent necessities, then applying time to all thirteen components (deep and shallow core necessities) in a uniform manner could bring tricky results. If for example a time factor for deep core necessities is identified by five hundred years (or a number five) and for shallow core necessities by one hundred years (or a number one), then their ratios are affected in the following manner: $5+5+5=15$, since there are three deep core necessities' components and because there are ten shallow core necessities' components, the final number for them is 10.
 15 So, the initial ratio is 15:10 or 1.5:1. This means that deep core necessities are one and half times more important than shallow core necessities. This also reflects in 60% of time factor weights for deep core necessities.²⁰ It looks OK by itself because the cost factor for them is also high and could push the total weights above 60%. However, there is an issue of time going into the future. Five hundred years from now the number for deep core necessities only doubles to 30 $[(5+5)+(5+5)+(5+5)]$, but the number for shallow core necessities jumps to 60 $[(1+5)*10]$. The new ratio is now 6:3 or 2:1 against deep core necessities, which reflects in 33.33% weights for them. It also means that the time factor for food stands only at 11.11% of
 20 weights. Because it has been recommended to treat the time factor and cost factor equally (equal share of weights), the cost factor is the only hope for supporting the significance of price movements for food. This entire scenario is based on an assumption that no more new necessities are coming in the period of five hundred years. Otherwise, every new necessity adds to the time summation and cost summation, reducing even further the significance of

²⁰Because there is also a cost factor, the percentage reference to weights can be addressed in two ways. Both factors can have a total of 200% weights or each factor can have 50% weights with a total of 100%.

price movements for deep core necessities, food in particular. The problem with this scenario is not, as it may seem, the number of necessities (thirteen all together), but the method itself. To be more specific, the problem comes from consequences of time movement on the initial deep and shallow core necessities' ratio. No matter what the initial ratio will be, this method allows time to continuously reduce the significance of price movements for deep core necessities. But there is a solution to this problem, it is a scenario #2.

Scenario #2

The initial ratio for deep core and shallow core necessities is the same 5:1, and it is not affected by the number of components, because now the entire index is split into two segments: deep core necessities and shallow core necessities. The initial time factor weights are 83.33% for the deep core and 16.66% for the shallow core necessities. Five hundred years from now this ratio will change to 10:6 and no matter how far into the future, deep core necessities will always have more than 50% time factor weights. The problem about this particular implementation of the time summation with an initial ratio of 5:1 is that deep core necessities are losing significance in a near future at a high pace but that significance is stabilized later. If this really seems a problem, then there are solutions to it such as: lowering the initial ratio, not allowing deep core necessities' time factor weights to go below 60%, unequalizing the time summation between deep and shallow core necessities so deep core necessities will lose their significance, but only gradually, and perhaps there are many others. The focus of this scenario is not on choosing the right summation method or the right ratio because, as mentioned earlier, there is no magic solution to the problem of a length of existence of deep core necessities. The focus here is on elimination of the length of existence approach and implementation of "always significant" approach to deep core necessities. The biggest advantage of this method is that it neutralizes the problem of a length of existence. Such length could be identified by a variety of numbers where all of them might seem correct. Also by choosing the always significant approach, physiological or biological importance of the deep core necessities will be maintained and the initial ratio between deep and shallow core necessities can be estimated with less controversy.

Both scenarios addressed only the summation of time, but not the summation of costs. The summation of costs is simple and straightforward. All necessities are treated equally with

respect to cost and the total cost redistributes weights uniformly.²¹ However, at the growth in necessities, this method of a cost summation allows deep core necessities' cost weights to go below 50%, with a possibility of pulling the total deep core necessities' weights below 50%. There is an explanation for it. The idea of a time summation, as in the Scenario #2, protects deep core necessities since their significance should not be reduced just by time. Their weights go down indeed, but only to give room to existing and new shallow core necessities. The cost summation, on the other hand, uniformly addresses significance of necessities with respect to cost. It means that price movements for food would never be significant if the total monthly expenditures on food per person could amount to \$10 in today's wages. The objective of the time factor therefore is to deal with such a relative cost in a manner that the transportation price movements for example, should never become more significant than the price movements for food if the transportation costs are much higher.

Earlier on it was mentioned that existing necessities can have the same weights for as long as there is no creation of new necessities.²² Since time is moving continuously, and the length of existence of any particular necessity should be an indication for the weight, then in absolute terms, the time factor continuously changes the ratios between necessities. However, in relative terms, it doesn't mean that shallow core necessities or the newest necessities have to gain significance in time, because there might be other factors changing that very significance in the same period of time. The best example in support of that can be facts about standard of living. Even though the standard of living addresses only non necessities, it could also be a good guidance for necessities. If, for example, there is a steady growth in poverty and a decline in the standard of living, the time factor reduces significance of price movements for the newest necessities first, bringing also a tendency to abolish them. At no change in the standard of living, the significance of price movements for all necessities is not affected by time and, at the higher standard of living, the newest necessities are gaining the highest significance since price movements for food are always very significant.²³ However, a

²¹It is not completely right when price movements are concerned. Later it will become clear why.

²²From the point of a cost factor, this notion will be fully examined in the following two sections.

²³There is going to be a full elaboration on this idea in the "Relative cost and chronological order of expenditures" section.

steady growth in the standard of living naturally creates new necessities. So, there is no apparent need to reindex weights at a growth in standard of living because such a process could have to be continuous and simultaneously would have to apply to a decline in standard of living. It's better to wait until a new necessity comes in and then deal with it. At that time the former newest necessities will gain significance shown by the higher time factor weights since their existence has been established not by time, but by the newest necessity.

All of this means that the length of existence of all necessities is needed only to establish the ratios between them, and if there are no new necessities coming into the index, the time difference of the same necessity cannot be shown by a different weight because, in order to do that, some weights must be taken away elsewhere. This underlines that, for the purpose of assigning a weight number, the length of existence of any particular necessity is bounded by the time of creation of the newest necessity and it cannot extend any further. The newest necessity should have the smallest "weight time unit," whatever such a unit might be.²⁴

Relative cost and standard of living

This section comes back to a cost factor and looks at the connections between relative cost and standard of living. Later (from the point of changes in expenditures) it explains why the cost factor weights don't have to be adjusted for as long as there is no growth in necessities.²⁵

The issue of relative cost and standard of living is directly related to a considerable matter. This matter is a possibility of abolishment versus growth in necessities. So far the growth in necessities has been portrayed as very probable, but not the abolishment of necessities. If there is an abolishment of any necessity then the adjustment of weights occurs in a reversed manner to growth in necessities.²⁶ However, because in this situation time doesn't move forward, since the length of existence of all necessities is bounded by the time

²⁴This application does not deal with issues such as what constitutes a time of creation or what the smallest weight time unit is. These issues are statistical or even political. Again, the focus of this work is on economics.

²⁵In this paper the term adjustment of weights and reindexing of weights will mean the same thing.

²⁶Abolishment of necessities is possible to shallow but not to deep core necessities.

of creation of the newest necessity, the time summation for shallow core necessities gives a smaller total time for them. This new total time is needed to change the basic ratio between deep and shallow core necessities. As a result of it, time factor weights for deep core necessities increase and shallow core necessities decrease according to a new ratio.

5 The abolishment of necessities however is not very probable for one major reason, the natural way of creation of necessities. But before getting into that, a short example about habitual preferences will explain differently why it is hard to abolish necessities.

10 A reference to the standard of living is an excellent guidance to prevent a paradox of growth in poverty and growth in necessities as far as the necessity index is concerned.

However, a growth in poverty itself is not an indication to abolish any necessity, if the desire to consume that necessity is present at all times. The best example in support of that might be a telephone. Those who have had a telephone in the past for a long time but now can't afford it, will still hold a desire to have one because they've got used to it in the past. Once their
15 situation improves, these people will get back to enjoying the convenience of a telephone, but may never buy the newest necessities since they were never used to them. The real reason here might be psychological preferences for savings rather than consumption resulting from bad poverty experience. The above example tells that goods must be around in a market for a long time before being declared necessities and from the same perspective, the state of higher
20 poverty would have to continue for a long time for some necessities to be abolished.

This doesn't define a reasonable, continuous poverty rate for allowing goods to be declared as necessities. This issue however is political in nature and will not be elaborated here. The focus switches to the possibility of continuous growth in poverty versus continuous
25 growth in standard of living from the perspective of relative cost. Just to mention that here the growth in poverty relates to reduced consumption of necessities, but the decline in standard of living relates to reduced consumption of non necessities without affecting a consumption of necessities. By itself, the above sentence means that the decline in the standard of living doesn't affect consumption of necessities by all those who have money, it only means that a
30 relative cost of necessities becomes higher. From the same perspective the growth in standard of living means lower relative cost of necessities. This lower relative cost is an important

feature causing creation of necessities and, until now, time has shown a steady growth in the standard of living. The growth in standard of living brings a decline in poverty because in an absolute sense, although there might be more poor people now than ten years ago, they are still better off than those poor people living two hundred years ago, since they have a free access to food banks and shelters.

From this point of view the notion of relative cost grasps an entire economic outlook as a ratio between necessities and non necessities. In basic terms, it is a ratio of average earnings to necessity consumption, and the best way to know this ratio is to look at the necessity index and compare it to the standard of living (existing CPI) index. Now it should be clear why the issue of abolishment versus creation of necessities is so tied up to relative cost of necessities in comparison with standard of living. Either creation or abolishment of necessities happens in a natural way because it largely depends on what the current standard of living is and in a case of creation of necessities, higher the standard of living, more chances for all consumers to repetitiously buy the same non necessity goods. However, all of the above does not explain the fact of a growing standard of living. There is one explanation for it and that's knowledge. Knowledge is inherited into future generations virtually at no cost. This has nothing to do with a cost of education but a cost of knowledge only. It means that once people understand how electricity works, it is very unlikely that they will ever have to go through the same understanding process from the very beginning.²⁷ The future generations will have the advantage of obtaining knowledge for free since so-called research and development costs were incurred by former generations and therefore the future generations can look forward to new inventions. From the point of knowledge only, it is hard to imagine an abolishment of electricity/energy as necessity. As time goes into the future and people become more sophisticated, the relative total cost of necessities will become smaller because knowledge brings a higher standard of living.

The relative cost also refers to the cost of resources. As mentioned in the original work, in order to have zero inflation for necessities, the economic concept of scarcity must never apply to them. Only an abundance of renewable resources can keep their relative cost

²⁷The best example of inheriting knowledge might be a demand for food. Once people understand that three meals a day signify demand for food, there is no reason to think that future generations will not understand that.

(in comparison with the cost of scarce resources) down for the exchange of a higher standard of living. That's why it is important to understand that future necessities should be knowledge-intensive but not resource-intensive because more knowledge can be created at lower relative cost.

Since changes in the standard of living may also cause changes in the necessity index, the question therefore is how to account on changes in costs with respect to major components' cost factor weights. There is a two-part answer to this question. The first part addresses an impact of changes in costs on inflation and the second part changes in costs on expenditures. The impact of changes in costs on inflation will be fully discussed in the next section. The rest of this section looks at the impact of changes in costs on expenditures.

The biggest difference between these two as far as application of weights is the notion of pure price movements. Unlike changes in costs resulting in inflation, changes in costs leading to changes in expenditures are not pure price movements. To say that otherwise, changes in expenditures relate to non necessities and non necessities' expenditures relate to a standard of living. Therefore, even though if changes in expenditures could result from changes in costs, the real/new costs however are not important here because the cost factor weights come from estimations. It means that neither the cost of former nor new goods can serve as an absolute reference to cost because the consumption of former goods was forgone for new goods which ultimately means that none of these goods can be considered semi necessities or practical necessities because the former goods are no longer consumed and the new goods were not consumed in the past. On the other hand, changes in expenditures could purely reflect changes in consumers' preferences even at no changes in costs. That's why changes in expenditures cannot serve as foundations for major components' weights in the necessity index. Since changes in non necessities' expenditures could result from changes in costs and such expenditures should not affect cost factor weights of the major components in the necessity index, then it is clear that cost factor weights address only relative, not real or actual costs. But the notion of a relative cost differs here from the notion of a relative cost discussed earlier. The former notion of a relative cost was directly linked to a standard of living for the purpose of creation/abolishment of necessities. The cost of necessities was related to the cost of non necessities. Here however the cost of necessities is not and must not be related to the

cost of non necessities because the purpose is to draw the line on necessities or to say otherwise, separate necessities from non necessities. The cost of necessities relates here to the natural variables such as physiological needs measured by time (food component), a climate (shelter, clothing and footwear components) and a distance (transportation component). These variables don't make up cost factor weights. They are only a reference to cost in a broad manner. That's why here a relative cost has to be an estimated cost. There are some very good reasons to accept an estimated cost as foundations for major components' weights. One reason was mentioned in the estimations' section in the example of food/transportation components. It became clear that a reference to cost cannot be accurate if the foundation of the cost factor for transportation component is a distance. The main reason for a relative/estimated cost to be foundations for major components' weights is a concept of the long-run equilibrium. This concept is based on a principle of not what the actual cost is but what it should be and it will be discussed in the next section. Even though the initial implementations of cost factor weights come from actual costs since such costs serve as a reference to significance of price movements, it is imperative to stress that the economy might not be in equilibrium and further changes in costs will occur. However, changes in expenditures which result from changes in costs do not imply the state of non equilibrium. These changes could only reflect consumers' preferences.

All of the above means that the initial estimations for major components' cost factor weights can be done only once. There is no need to go through the same process again if changes in costs affect expenditures because only the relative cost is considered here. Therefore the cost factor weights can remain the same for as long as there is no growth in necessities.

Implications of inflation on weights

Because actual costs are taken for initial implementations of major components' weights, then changes in costs at no changes in expenditures should be considered as foundations for weights. This statement is simply true. At no changes in expenditures, actual costs are the best reference to significance of price movements. There would be no need to elaborate on this issue any further if indeed there could be nothing more to it. But there is something which has not been discussed yet, and this is how the actual costs happen to be as

they are. The actual costs come from former price movements. The question one may ask is whether or not the former costs could be a better reference to the significance of price movements if actual costs seem to be too low or too high and the former costs seem to be just right. The reason to think in this manner is that higher costs for example might be seen as the problem of inflation and therefore the argument here does not focus on who's got to decide if the costs are really too high but it focuses on the idea that the problem of inflation cannot match with significance of price movements because inflation does not increase such significance. The problem of inflation only tells that the costs are too high and they should come down. To say that in philosophical terms, the foundations of significance of price movements cannot be based on a problem. The significance of price movements must be based on desired costs. It means that such costs may go up or down, but in a long run, they should generally remain the same.²⁸ But because it might not be easy to determine the desired costs, actual costs can be a good starting point not only when/if former costs seem too low or too high, but especially because actual costs are realistic, and measuring inflation is about prices in the future, not in the past. The future will show whether or not former/actual costs were just right. But that's not the point. The initial implementation of necessities' weights based on actual costs is only a starting point. However, it is not important to do it right from the beginning because there are always going to be price movements affecting cost ratios among major components. The question here is how to account on these changes if there are no new necessities coming into the index. It becomes obvious that even if the initial implementations of weights based on actual costs could be right, further justification has to be made as to the future costs which in time will become actual or perhaps even desire costs. The objective of this section is to explain that.

If the desired costs in a long run can remain the same, then there is no need to look into periodical reindexing of major components' weights in the environment of no new necessities. This is simply true because minor price movements should not alter a significance of any component. To explain this in basic terms, the cost factor estimations for the shelter component for example are based on a climate and the only justification for reindexing weights should be a scenario of a colder or warmer climate because that's what changing a

²⁸ This is only true in some cases but not in all cases. Soon it will become clear why.

significance of this particular component. However because cost factor weights are derived from actual costs, then major price movements of any component are reasons to establish new ratios with other components. But major price movements affecting greatly the ratios between necessity components are unlikely. It means that continuous price movements in one direction for any component without price movements or price movements in an opposite direction for other components will probably not happen. This matter has to be examined closer to strengthen the notion of non adjustment/reindexing of major components' weights in a non necessities-growth environment.

If indeed there are continuous price movements of any major component in one direction and no price movements or price movements in an opposite direction of any other component, one very important condition must be met to consider reindexing of weights. This condition is identical and frequent expenditures on semi necessities goods (of a component experiencing continuous price movements in one direction) for a reasonable period of time. This reasonable period of time will later be addressed as the adjustment lags. But before getting into that, a closer look at the condition will reveal its importance.

Identical and frequent expenditures on semi necessities goods can establish trends in real costs at the assumption of good monetary policy. But if this condition is not met, then two things come to mind: pure price movements and the bias. In this case the inflation rate would have to be significant to consider reindexing weights and still there could be an issue of an impact of standard of living on expenditures. Furthermore, consideration of reindexing weights might have merits in the case of the food component because its characteristics are many different goods consumed very frequently, and that frequency tells a lot. It is not so simple for transportation, where weights reflect expenditures based on a distance. Unlike expenditures for food, which are based on unchanged physiological needs, expenditures based on a distance can change if that distance is changed, which then may show in uneven frequencies of these expenditures. Also, the issue of the technological impact of the car industry on durability or longevity adds another problem to reliability of data collection based on frequencies. All of this means that in order to consider reindexing weights, any inflation rate must meet all the requirements of pure price movements to become a reason for new weights. Therefore, without the condition of identical and frequent expenditures, reindexing of weights has no solid foundation.

In the case that this condition is met, then major price movements affecting ratios between necessity components require weights to be adjusted. But as mentioned earlier, realistically it is unlikely to happen. Since the food component might be the best one for reindexing weights because it can meet the above condition, a closer look at what if analysis will explain why the ratios between food and other necessity components may remain the same.

The initial analysis begins with an assumption of equilibrium and no inflation. The costs of labour and capital are the only ones to be considered. The labour cost is the first one to be examined. The notion of labour cost assumes that the value of different work in traditional economy (or economy of necessities) can be compared in a similar manner.²⁹

Continuous but temporary deflation for food as a result of lower compensation would mean that farmers are willing to work for less if none of them leaves the industry and if the demand for their products with respect to time is the same.³⁰ The second condition about demand for farm products with respect to time justifies working for less for the sake of continuity of employment or to say otherwise, job security. However, willingness to work for less violates an initial assumption of equilibrium. Since continuous demand provides job security, then that security is an attraction to offset lower compensation by steady employment preventing at the same time an entrance of newcomers into the industry which otherwise would create a more competitive environment and alter the bottom line - compensation and job security. In this situation continuous deflation for food must mean that the economy is not in equilibrium, but rather it's moving towards equilibrium. Therefore in order to assume economy in equilibrium, the farmers' compensation must not be an attraction for newcomers to enter the industry. If such compensation is indeed unattractive to start with, then its further reduction creates a question why farmers are willing to work for less if they

²⁹This assumption refers to physical efforts and working conditions only but largely excludes knowledge and education. It can be supported by the fact that production of deep core necessities in particular does not require extensive knowledge and education as far as the total labour factor is concerned. The impact of knowledge will be briefly mentioned at the end of this section.

³⁰To make this argument more clear, instead of a reference to farmers, it is better to say employees of farmers or employees of agricultural industry since they are those who don't own any assets such as land, don't feel an attachment to land and therefore, are free to go from one industry to another. For the sake of simplicity, the word farmers can remain.

don't have to and especially because continuous demand for their product should sustain the same selling price. The reason for inflation is simple; suppliers and producers prefer more money, not less, and therefore the same should apply to farmers. That's why it is correct to assume that farmers are not willing to work for less but if they do, it is because of other economic factors beyond their control. As a result of it, some farmers will leave the industry and go to other sectors of the economy, including other necessities' sectors adding to a competitive environment. In the meantime, the competitive environment of these sectors will push the wages down and, at the very same time, farmers remaining in the agricultural industry gain a better position to obtain higher compensation since there are fewer of them. Exactly the same but a reversed process will occur at inflation for food with respect to compensation only. However in real life, the process of labour mobility from one industry to another is not automatic and flexible, but it takes time. It can be referred to as the adjustment lags and it is directly related to a possibility of continuous but temporary inflation/deflation as mentioned earlier. It is important to stress that more competitive in terms of free entry and minimum regulations certain industry is, shorter the period of adjustment lags and "vice versa." Therefore, in terms of inflation, rising cost of labour is not necessarily a reflection of higher value of work in the monopolistic and unionized industries. Fortunately, industries of necessities are mainly competitive and in terms of adjustment lags, the process of labour mobility would not take too much time because even though there could be many farmers who feel attachment to land, there are also many who don't and they are the marginal part of the labour force, free to come and go and, at the very end, they are the ones causing changes in the labour cost. If all of the above seems true, then there is no reason to expect permanent price movements for any necessity component in one direction, at no price movements or price movements in an opposite direction for other necessity components as far as compensation is concerned. As far as weights are concerned, this tells that temporary price movements are not a signal to reindex weights because that period of time could be nothing more than periodical disequilibrium and because of some lags, an adjustment process could not occur earlier but rather, it is still about to happen.³¹

³¹Even though this entire argument seems as a review of competitive nature of agricultural industry, it is really a launch for the awareness and understanding of the adjustment lags.

An argument about the cost of capital resources in economies of necessities could be largely simplified if a total production of these necessities would be based only on renewable resources. Supply of renewable resources is similar to the supply of labour in terms of flexibility of increasing and decreasing supply whenever needed. Therefore, this issue will not be examined here. However, also non renewable resources are required in production of necessities. As long as there is an abundance of these resources to maintain continuous supply of necessities, the concept of no scarcities (scarcities as defined in the original work) can be used to justify again the flexibility of increasing and decreasing supply. From this point alone, a period of inflation or deflation is only a period of disequilibrium because future's adjustments will occur. But to know such adjustments might not be easy if a long period of time is needed to come back to equilibrium. This can be explained by an example of land as a resource.

It should be stressed that there must be enough land to allocate it to alternative uses in a case of population growth to meet the total human needs. If this condition is not met or if there is not enough farm land to feed the total population, then the issue of scarcities in deep core necessities is beyond the scope of this project. Because some land is required to produce all necessities and because changes in population are common and they affect the use and the cost of resources such as land, the quality (fertility), quantity and location (location does not address real estate values but refers to distribution of necessities) of land are all factors affecting differently a cost of production of different necessities. This is a reason to look into reindexing of weights. But if for example the population growth is continuous then it will reflect in higher values of land in all sectors of production of necessities. This of course will lead to a higher cost of necessities and a lower standard of living assuming everything else constant. But if the demand for a high standard of living remains strong then this will eventually be reflected by a decline in a total family composition or to say it simpler, fewer children. The final result of it is a negative population growth at decreasing values of land. It is infeasible to measure price movements for land through such a lengthy period of time holding everything else constant (or assuming that there aren't other variables affecting these prices in a first place). In reality there is a lot going on and that's why the issue of long term cost adjustments and their impact on weights could become too complex to conclude it satisfactory without contention and therefore, it cannot be examined any further. However, for

the purpose of applying weights, it is more important to realize that there are long adjustment periods than to focus on price movements because uneven price movements of the same resources such as land is not a signal to adjust major components' weights if these price movements seem to be only temporary. This tells that the foundations of the entire method of applying necessities' weights are based on the long-run equilibrium, but not on periodical changes in costs. But because it might be hard to determine whether certain price movements are only temporary or permanent or what constitutes long-run equilibrium, the only way to deal with it is to reindex weights.

The resource such as land is a very unique one, because it is needed for the production of all necessities. To say it otherwise, land cannot be replaced by anything else and it is a necessity. However there are also resources which can be classified as non renewable and scarce and unlike land, these resources may come and go as part of production and consumption of necessities. The reason that these resources may come and go exists in their cost and links to the ongoing impact of knowledge of a progressive technology. But the impact of knowledge may never have a positive effect on costs if a significant amount of non renewable and scarce resources is required to produce goods. Continuous depletion of these resources continuously raises their cost.³² Obviously this cannot last forever. That's why the problem cannot be solved by an increase in productivity because it may only be a temporary solution to it. It takes knowledge and technology to produce new economic goods at a lower relative cost to replace the former, more expensive ones. This short and simple argument is a sufficient explanation to justify a methodology of applying weights for all scarce and non renewable resources. If it's clear that it is a matter of time to replace certain goods by others then uneven price movements in different components resulting from price movements of the same resources would not be a signal to reindex weights.³³ Reindexing of weights will occur

³²That's precisely why neither the former nor actual costs might be the desired costs in the initial implementation of cost factor weights.

³³It should be stressed that these resources should be seen as practical or temporary necessities because they are the only resources to produce or consume necessities and there are no substitutes for them even though they are not necessities just by themselves. Gasoline might be the perfect example here. The reason for this footnote to be brought is that this entire section refers to reindexing necessities' weights of the major components but not to reindexing semi and non necessities goods falling into these components. Reindexing of semi and non necessities goods should be done at the time of expenditure surveys because changes in costs may cause changes in expenditures and therefore, the new, actual costs are the basis for weights since significance of price movements changes every time these costs change because non necessities in particular have no time constraints whatsoever. All of it means that changes in gas prices should not affect weights of the transportation

at the replacement of former necessities (necessities as defined in the footnote) by the new ones. This phenomenon can be seen as the abolishment of former necessities and the creation of new ones for the same consumption purpose. The reason not to reindex weights any earlier than at the replacement of former necessities by the new ones is the definition of weights. An inflation of scarce and non renewable resources adds to the problem of inflation and therefore a significance of price movements cannot be increased on a basis of the problem of inflation as mentioned earlier. Continuous inflation of these resources implies economy in disequilibrium.

The impact of knowledge and technology on productivity without a problem of scarcities in resources will have a positive effect on inflation because there is no issue of rising costs but on the contrary, knowledge ultimately allows to select alternative resources at reasonable costs. Consequently, the weights might be adjusted, but only if uneven price movements of major components are caused by price movements of their semi necessities goods (goods which have been a part of these components for some time).³⁴

Relative cost and chronological order of expenditures

This section leaves a final thought about the awareness of relative cost. Its objective is to prove that a sole reference to relative cost as the cost ratios between major components can be misleading. In this section the notion of the relative cost connects to a chronological order of expenditures which then makes the cost factor and the time factor inseparable elements from each other. The following analysis explains why.

There should be no doubt that an inflation on something cheap is not as significant as the same inflation, but on something expensive. Simply speaking, an inflation of expensive items causes higher losses in buying power than an inflation of cheap items. That's why

component but they should affect weights within this component every time surveys are done.

³⁴There is no need to elaborate on the impact of knowledge any further since the argument could occur to be simple. The last point to include is that knowledge might not be seen as a human resource but rather as something superior in selecting a combination of human and capital resources to produce economic goods. The notion to keep major components' weights stable predicts that knowledge will have a positive impact on all sectors of economy and in a long run, the cost of producing different necessities may remain similar as far as the ratios are concerned.

significance of price movements can be expressed as the cost ratios of any two items or any two components. This is so obvious and so true that it had been the only foundation for weights throughout the years. However, the cost ratios alone are an inadequate way of expressing significance of price movements once chronological expenditures are also taken into account. This can be explained by a reference to the standard of living in which growth and decline might be symbolized by production of additional goods at its growth and reduction in production of goods at its decline. If for example all goods produced can be classified according to their chronological expenditures where deep core necessities have the highest number (number ten) and the end of the line non necessities the lowest number (number one) since these non necessities are the first ones not to be purchased in a case of the decline in standard of living, then changes in the standard of living would affect classification of all the goods in the following manner. At the growth in standard of living, all additional goods produced would obtain a number one, the former end of the line non necessities a number two and the deep core necessities a number eleven. In this situation and in proportional terms, the highest significance gained the former end of the line non necessities because it might be said that their significance doubled from a number one to a number two. Significance of the deep core necessities increased only by 10% from a number ten to eleven. A similar but reversed process would occur at the decline in the standard of living. Non necessities goods which were positioned next to, but higher than, the former end of the line non necessities would lose 50% of their significance because their hierarchy declined from a number two to a number one, and the former end of the line non necessities are no longer produced so they don't count any more. The deep core necessities would only go from a number ten to a number nine which also reflects a 10% loss in their significance. Deep core necessities therefore are in absolute terms the highest in significance because they are the first ones to be purchased and the last ones not to be purchased, but they are the lowest in relative significance because changes in standard of living do not affect them much. The most vulnerable to changes in standard of living are the end of the line non necessities.

This example can now be combined with necessities' cost factor weights. At the growth in standard of living the relative cost of necessities goes down, which means that according to the opening statement, their significance should also go down since they are no longer as expensive as they used to be. However, at the very same time the economy produces

more, diminishing the chances for necessities not to be purchased (if necessities don't have to be purchased since they can be produced by consumers as it was explained in terms of going back to the land and producing food). This also means that their significance as far as chronological order of expenditures goes up. Just the opposite happens at the decline in standard of living. Now it is obvious that changes in the standard of living (if they can be symbolized by changes in the number of goods produced) cause opposite movements in direction of significance between the chronological order of expenditures and the relative cost of necessities. Therefore, changes in the standard of living at everything else constant do not affect major components' weights of the necessity index, not only because these changes apply to non necessities but also because the notion of chronological order of expenditures neutralizes the impact of changes in the relative cost of necessities as in comparison to the cost of non necessities.³⁵ Of course it is quite a different story at the growth in necessities.

However, the climax of this section is not about understanding the importance of chronological expenditures on relative cost, but it is just about to come. The climax of this section is about inflation. In the former section a lot of attention was given to non reindexing major components' weights in a case of inflation and now in this section there is a further elaboration of this idea. It can be explained by using transportation component as an example. If there is an inflation for transportation and, as a direct result of it, the economy begins to produce less, then the transportation weights must not be increased. Since the economy produces less, the significance of transportation with respect to chronological order of expenditures goes down. If, on the contrary, and under the same condition transportation weights could continuously keep increasing, then at a certain point in time where these weights are very high, all of the sudden transportation as a necessity would disappear because it has simply become too expensive. This is quite abstract and rather an unnatural probability, but it well explains possible consequences of inflation with regard to the methodology of applying weights. In real life, a lower output of non necessities as a direct result of inflation for transportation would likely be followed by some lower expenditures for transportation, which means that there is also a chronological order of expenditures within the transportation component. Keeping the transportation weights stable in such a particular case of inflation

³⁵ An existing methodology of measuring inflation does not take the chronological order of expenditures into account allowing necessities and non necessities to be in the same index and also allowing necessities' weights to go down at the growth in standard of living. This is fundamentally wrong.

will control the bias because changes in standard of living do not affect deep core necessities as much as other necessities, which ultimately means that higher transportation weights as a result of inflation may increase the bias at further changes in standard of living. That's why an initial recognition of any necessity with respect to its chronological placement among other necessities is a key factor for measuring pure price movements.

The above analysis showed that a sole reference to the cost ratios would be just an insufficient and inadequate way of addressing the significance of price movements. The cost of every major component must link primarily to the chronological placement of that component in the necessity index because together, this creates a dual and inseparable combination of expressing total significance. Such a combination might be really helpful in a case of inflation where the new cost ratios might seem as a new reference for weights. Therefore changes in the standard of living could give some explanation for the new cost ratios and serve as a guide when dealing with weights.

The last point to be mentioned in this section is about time factor weights. It should be obvious that the notion of chronological order of expenditures is the foundation for time factor weights. The reason for introducing this notion was to make a stronger point about the issue. But in real life expenditures do not happen chronologically, which means that people don't have to buy food first before buying anything else. That's why an expression of "chronological order" was used to classify these expenditures accordingly. Furthermore, the notion of chronological order of expenditures is quite abstract and cannot be practically applied in measuring inflation because consumers make many expenditures automatically and would probably not be able to classify them well even by themselves since non necessities in particular could give lots of problems and because such classification would be required from consumers every time the surveys are done. The time factor (even though it may not sometimes reflect chronological order of expenditures for semi and non necessities) considers the long-run aspect in application of weights. The support for it (the time factor) is based on the theory of demand for semi necessities which states that the greater the length of existence

of any good, the harder it becomes not to buy it (at a higher price).³⁶ The concept of the time factor fits well into the notion of long-run equilibrium.

SUMMARY

5 The issue of savings and investments was the main reason to look for new ways in the application of weights. This invention offers a good solution to it by quoting the inflation rate based on the current necessity consumption which (compared with a future's consumption) may not change in time. The reason not to expect changes in necessity consumption comes from a theory of continuous demand for semi necessities. These semi necessities in reality 10 make up the necessities' components. The combination of the cost and time factor weights created a new method for measuring significance of price movements for the cost of living. This method is based on the notion of long-run equilibrium for the cost of living which in simple terms can be defined as the same ratios for major components. That's why so much attention was given to justification of keeping the weights stable even though there could be 15 attempts to adjust them. This of course refers to major components only because they are the foundations of long-run equilibrium. There wasn't much coverage for semi and non necessities. However, applying time factor weights for them is as vital as doing so for necessities because continuous demand particularly characteristic to semi necessities is the greatest closeness to necessities in terms of no substitutions. From the technicality point of 20 view, time factor weights significantly reduce the bias because the length of time of no substitutions identifies significance of price movements accordingly. As far as the big picture is concerned, the greatest difficulty of this method is the initial implementation of it, which is based on estimation of minimum costs and estimation of the lengths of existence. It is practically impossible to simply define the difference in significance between deep and 25 shallow core necessities. But the problems of the initial implementation are only marginal in comparison with a superiority of this method versus the existing one. The greatest advantage of this method is its universal inflation rate which applies at all times to all humans regardless of their wide spread incomes. As far as weights are concerned, they will never be perfect but

³⁶Therefore, higher prices for semi necessities do not cause substitutions. In a food component for example, the substitutions could result from a health factor but not from price fluctuations, because the health factor is more prominent and sensitive than the changes in prices at the low relative cost. Ultimately, this method of applying the time factor weights (for semi necessities in particular) is neither the upward nor downward-biased.



they don't have to be perfect. They are the guidance in assessing significance of price movements and they don't come from a digital world because measuring inflation is based on a law of demand. It is a philosophy expressed in numbers.

OTHER MATTERS

Subsidies

Because in a very short form the new method of measuring inflation can be described
5 as mechanisms of the cost and time factors, government subsidies therefore may not be seen
as part of the foundation of this new method. Subsidies only add to the cost factor and by this
they indicate a higher significance of any component with respect to cost. The main reason to
go beyond the retail aspect of measuring price movements exists in the nature of continuous
demand. Since it might be reasonably assumed that changes in subsidies from one period to
10 another will not alter consumers' demands, changes in subsidies therefore are an essential part
of pure price movements. But even if changes in subsidies could lead to changes in
expenditures, this still doesn't naturally exclude subsidies from a total cost factor of any
major component with respect to the significance of price movements. Because of subsidies,
the notion of a "basket" which confines expenditures to the consumer level only, can no
15 longer be used in the necessity index. The notion of the necessity index focuses on the total
cost of necessities.

The rationale for subsidies might be compared to the needs and wants which simply
means whether or not governments need to or just want to subsidize. But the difficulties with
20 subsidies as far as measuring inflation are not related to the inclusion of the necessity aspect
coming from drawing the line between needs and wants as it is on the consumer level. These
difficulties come from a political nature of dealing with a consumer's demand, which also
extends to international levels. The following argument explains characteristics of three
different types of subsidies.

25 The need for subsidies in agricultural industry for example can be explained by a
reference to disaster relief programs. In order to keep farmers on the land after a natural
disaster destroys their entire crops, governments must subsidize to ensure an adequate supply
of food for the next seasons in the case when another disaster could strike other farmers.
30 Those farmers who were unfortunate initially will then be able to produce food if other
farmers can't. This type of subsidy can only be included in cost factor weights but not in

measuring inflation because the products of farmers struck by a disaster are not delivered to stores and therefore their prices cannot be measured. Natural disasters should be seen as another natural variable adding to significance of cost factor weights, that's all. This can be easily explained by an example of food consumption in cafes and restaurants. If such consumption increases then it only means that consumers pay more for food but it doesn't mean that the food costs increase. Exactly the same applies to subsidies. Changes in subsidies resulting from natural disasters are not directly related to production of food and therefore are not linked to its cost.

There is no need to subsidize any part of a production process or a business cycle if the demand for the product with respect to price is assumed to last without a subsidy. The reason to subsidize therefore has to be supported by an assumption that, without such a subsidy, the future of any particular product in the market is unknown. If that's so, then all questionable products can be classified as non necessities. Governments really don't need to subsidize non necessities unless they are necessities of the standard of living. Education can be considered such a necessity because it is hard to imagine a substitute for education. But in a case where substitutes are available, the decision to promote consumption of a certain non necessity is a political one. Promotion to use public instead of private transportation might be a good example here because externalities are considered. Here's where the argument really begins. It is impossible to see and justify that governments only want to subsidize without detecting any need for it, since otherwise there would be no explanation for directing consumers' demands on a certain path without obvious benefits and at the cost of taxation. Subsidizing public transportation therefore might be explained by the need and want for it. The need comes from problems of congestion and pollution and the want from promoting demand for public by weakening the willingness to substitute for private transportation. Governments simply want people to use public transportation and that's why the pure need for a subsidy cannot be justified if people are willing to use private transportation instead. The reason for this example being brought is to show that similarly to the car industry, it is also impossible to isolate pure needs from pure wants in government subsidies. The size of a subsidy represents only an encouragement to use public transportation, but it is not a fine line between the need and want for such transportation with respect to cost. Because of that, this type of subsidy must be included in measuring inflation, since it is an inseparable part of the

total cost of providing public transportation.

The examples of public transportation and disaster relief programs show that the total and direct cost of production serves as a reference in inclusion of subsidies in measuring inflation on the consumer level. The aspect of needs and wants so characteristic to consumers cannot be transformed on the public/government level, especially if these needs and wants are inseparable and if such separation is needed for the purpose of purity of the necessity aspect of measuring inflation. Later there will be a short discussion in relation to the necessities of the public sector and an explanation of why these necessities should be separated from the private/consumer level. But for now, the notion of the total and direct cost of production is going to support again an inclusion of another type of subsidy in measuring inflation and that's an export subsidy. It might be inclined to say that export subsidies represent governments' wants since they do not relate to the domestic needs of consumers. These subsidies are therefore the most political ones. There are no economic principles which could satisfactorily govern political decisions about these subsidies and therefore only mutual consents can provide common standards in dealing with them. That's why the rest of this section only identifies some aspects of the main issue and examines consequences of export subsidies on inflation.

The starting point in dealing with export subsidies is the initial assignment of major components' cost factor weights. These weights cannot be assigned to the exporting country because they represent products consumed elsewhere. They should be assigned to the country receiving these products or to say it otherwise (for the purpose of addressing domestic/foreign relations) a domestic country. But this doesn't tell why subsidies should be included in weights because the domestic country does not pay them and may never do so if the relation with the foreign country continues. However, regardless of who pays, subsidies should be included in weights because otherwise the significance of the cost factor would be understated. Furthermore, once the foreign country decides to discontinue subsidizing exports, the domestic country will then face the new costs coming from exporting products from other countries or developing an own industry to create these products. The exception where one may not want to include subsidies in cost factor weights would be all those subsidies related to the costs of transportation because the notion of total and direct cost of

production could become too broad to account for large, global distances. This might be especially true if the total and direct costs of production in both countries could be similar and only transportation costs make the difference between importing and producing domestically.¹

An inclusion of subsidies in weights but without transportation subsidies will show the real production costs and may become a turning point if such costs are high by encouraging domestic industries to emerge in response to these costs which then will lead to a competitive environment internationally. But the fundamental reason for that is inflation. If for example the total costs to produce domestically can be lower than the costs incurred abroad and the total costs account for an inclusion of foreign subsidies then even if (and without foreign subsidies) the domestic costs stand higher, it will still be more beneficial to produce domestically because the same inflation in both countries would have a different effect on an overall domestic inflation rate once foreign subsidies are included in domestic cost factor weights. To make this point clear it should be stressed that domestic industries may not be willing to emerge if foreign subsidies are growing but without inflation and, by the same token, these subsidies would indirectly and relatively increase the domestic costs of production because the end result of it is lower prices for consumers at no inflation for subsidies. However it is not the same at the growth in subsidies because of inflation. The prices for consumers would remain the same but the domestic necessity index reads inflation because of rising costs of subsidized products. The reason for domestic industries to emerge lies in all the government's help to offset financial implications, but it also reaches the foreign country at its ground. An inflation of exported goods at no inflation of goods deemed for domestic consumption would allocate more human and capital resources to export production if there is an abundance of these resources since it's simply profitable to produce for exports.² However, in this scenario there is only a temporary inflation in the producing country insufficient by itself to discourage import by the other country. There must be an expectation

¹That's why the notion of total and direct cost does not account for additional distances as a relevance to domestic distances if any product can be produced domestically. In a case of tropical fruits being exported north for example, such distances are not additional but minimum and therefore any form of a subsidy related to these distances should be included in weights.

²That's why there is no need to include export subsidies in weights of the producing country because in a long run, the cost of export should equal the cost of domestic production if the same goods are considered. Furthermore, if a production of certain goods is purely export based then the necessity index cannot really include these goods since they are not a reflection of the necessity aspect characteristic only to consumers of that country and because otherwise there would be problems in justification of application of weights.

of permanent inflation in exporting country, even if it is moderate, in order for domestic industries to emerge. Such expectation could come for example from a forecast of growing opportunity cost for the value of work in that country as a result of boom and prosperity. If indeed there could be steady inflation, then it would become harder and harder for taxpayers to sustain subsidizing rising costs and it can only take a political decision to change that.

That's why the initial high costs of production in an exporting country might be already an attraction for domestic industries to get into the business if these costs are expected to rise even further, since higher costs must meet with higher subsidies. As far as inflation itself, the worse possible scenario for any government is to have high inflation and high unemployment. It means that once high costs of imported products begin to rise even further, this will significantly affect an overall inflation rate because of the way weights are applied. In the meantime, all those who could work in necessities' sectors of economy but don't because of heavy foreign subsidies, might not work at all.

In spite of any attempts by governments to help domestic industries, it takes international agreements to come up with standards of dealing with subsidies. The right and ability to produce necessity goods domestically should not be taken away by foreign political determination for heavy subsidies.

Rationale beyond blank inflation rate for shelter

The two reasons why expenditures on home repairs and maintenance were not mentioned and considered as a good source of data for tracing construction costs are characteristics of these expenditures and the age of homes. Expenditures on home repairs and maintenance are usually enclosed to the so-called maintainable items only and do not give an entire picture of a total replacement value. The age of homes may make the cost of some repairs incompatible with a new construction technology, which is an indication of trends in new developments. That's why such expenditures might to some extent be considered in measuring inflation but they cannot account for a complete shelter's inflation rate.

But if at any time there are no new developments which are needed for a complete inflation rate, and most expenditures for maintenance and repairs seem only decorative rather than essential, it was suggested to either leave the inflation rate blank or read it as zero

inflation. The objective of this section is to clarify that. There is a difference between blank and a zero inflation rate. Technically speaking a zero inflation means that the currently measured products have not gone up in price since the last time when being measured. The blank inflation means that the inflation rate is unknown because the products have not been produced and therefore cannot be measured. The problem with zero inflation rate in application of weights comes from forcing no inflation without any reliable data. In a case where there is for example a 5% inflation for everything, even if there are no new homes built, the tendency to assume a 5% inflation for construction costs would remain, but a zero inflation rate for the shelter would pull the overall inflation rate below 5%. That's why in a case of no new developments, the method of the blank inflation rate should be used. The blank/unknown inflation would give no weights for the shelter component but automatically and proportionately reindex all other major components' weights. Since in this project so much attention was given to keeping the major components' weights stable, such automatic reindexing might seem in contradiction to what have been said. However, that's not so because of the following reason. The method of application of weights is based on the long-run equilibrium, and therefore a presence or an absence of the shelter component in any particular period does not affect the ratios among all other major components, but it only changes significance of shelter in a periodical manner because in the long run, new home developments will continue and the long-run ratios among all components will remain the same. But there is a problem here which is characteristic only to this, blank inflation rate method, and is not present in a zero inflation rate approach. If no new developments or only few developments occur often, the long-run weights for the shelter will go down reducing its significance. As mentioned in the original work, quoting the inflation rate for the shelter from prices of new homes might be controversial and therefore someone may want to reduce significance of shelter for that very reason. The method of the blank inflation rate does this automatically. However, significance of shelter should not be reduced. Now, after the subsidies' section has been written, this can be explained differently. Disaster relief programs add to significance of the cost factor, but they are not a part of measuring inflation because nothing is produced. Similarly, land is inseparable from a building but only prices of new buildings/homes can be measured since homes are necessities. Therefore, the entire significance of homes/shelters must include value of land (not location) because people

always pay for the land when buying a home. But the source of the problem is that no new home developments automatically eliminate the entire significance of land and a building in the blank inflation rate approach. This problem can be solved for example by an extreme diligence in measuring prices of new homes in the period of only few developments and
5 applying these numbers to all the weights assigned to shelter. Also, in the period of many new developments which comes after the period of no developments, much higher weights can be assigned to shelter in order to make up for the period of an unknown inflation rate and smoothing by the same an overall impact of the blank inflation rate. In this approach, the significance of shelter is only slightly reduced. This might not be an ideal solution to the
10 problem, however, since it comes from the objective to join the significance of land and a building together, it can be accepted in the new method of measuring inflation.

Necessities of the public sector

Measuring inflation of the public sector through government expenditures cannot be
15 done. The source of the problem is that necessities of the public sector do not equal and are quite different from necessities on the consumer level. They are not equal because, once, for example, the health care and education which might be considered as public necessities, are given to the private sector, they will never be the same. There is going to be a certain part of the society which will not spend much, perhaps very little or hardly anything on health care
20 and education not just because these people can't afford it but because quite often these people would not want to spend. This might be true if many individuals, instead of spending on health care and education, would rather save money, spend on non necessities or decline an offer of additional hours at work to earn extra money for health care and education. As mentioned earlier, the goods might be defined as semi necessities or practical necessities if
25 95% of the population have them. Health care and education therefore at the consumer level (and in the same form as at the public level) would probably not reach 95% of population. This underlines that anything expensive and affordable only by a part of population cannot be a necessity. The same applies to the public sector. An ability to pay for necessities of the public sector runs in pair with the ability to tax the taxpayers. Since health care and education
30 were excluded from the necessity index because of the characteristics of their demand, higher or lower taxes, presumably for the very same thing, cannot be understood as inflation or

deflation. These taxes portray an overall economic wealth and ability to finance public necessities. Therefore, measuring inflation for such necessities would be like measuring changes in aggregate/political demand but not measuring changes in the cost of these necessities since their cost is too vague to define. Furthermore, an inflation rate for public necessities would not be as reliable as inflation rate on the consumer level. All consumers are virtually involved in shaping the prices at the retail level, but only few politicians do the same at the public level through the tax system.

The reason for this section being written is to explain that necessities of the public sector are not the same as government subsidies even though both may seem equally important. Because some subsidies should be included in measuring inflation, then the tendency to go even further and include public necessities as well might be there. However, necessities of the public sector are really non necessities on the consumer level. That's why the public sector is needed to provide such necessities to everyone, however, everyone's access should not automatically imply necessity. Taxation makes up the standard of living.

The specific weights and examples set forth above are provided to illustrate the invention and are not intended as limiting. Additional methods within the scope of the claims will be apparent to those skilled in the art.

Claims:

I claim:

1. A method to calculate a CPI number comprising the steps of: implementing weights for necessities and semi-necessities, including selected non-necessities goods in necessities components, based on cost and time factors only, and adjusting for government subsidies.

Docket No.
2001-7032

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD OF CALCULATING A CONSUMER PRICE INDEX

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International Application Number _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

2,285,165

CANADA

07/10/99

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

PCT/CA00/01159

OCTOBER 5/2000

PENDING

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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